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COMMUNICATIONS

TELANGIECTATIC GRANULOMA — BOTRYOMYCOSIS

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As these two historically closely associated conditions are rarely met with in ophthalmological literature, a typical case of telangiectatic granuloma of the eyelid may be of interest.

Botryomycosis was first found by Bollinger (1869) in the lung of a horse; 10 years later Rivolta described the frequent botryomycotic tumour in stallions after castration. After that, cases in the skin, muscles, the udders of a mare, the inner organs of horses were described as well as occasional cases in other animals (Torlais). The most recent article on the subject dealt with a case in a pig (Clarenburg and van Heelsbergen, 1933).

The disease is characterized by conglomerates of little globules, measuring 5/100 micr. and resembling a bunch of grapes. The globules consist of a thin capsule, containing numerous cocci, measuring about 1 micron. Under the influence of this botryococcus ascoformans (syn. zoogloea pulmonis equi [Bollinger], dyscomyces equi [Rivolta], micrococcus botryogenes [Rabe], botryococcus ascoformans [Kitt]) tumours develop consisting of a framework of connective tissue filled up by granulation tissue. In the centre of these areas of granulation tissue the conglomerates of botryomycotic globules are found. Often this centre becomes necrotic and melts together, fistulae develop towards the free surface, in the discharge of which the conglomerates of typical globules can be found enabling a clinical diagnosis.

The botryococci freed after rupture of the capsule of the globules, cannot be differentiated from ordinary staphylococci in the smears. As to the possibility of differential diagnosis in cultures opinions differ though all authors agree that at any rate the differences are extremely small. It can only be stated that one has not succeeded up till now in obtaining botryomycotic tumours with ordinary pyogenic staphylococci, as has been reported for the botryococcus. In an inoculation experiment with botryococci, recently performed by Clarenburg and van Heelsbergen, the botryococci proved to be pyogenic (development of abscesses), in the neighbourhood of which a small tumour developed, containing the typical globules.

Telangiectatic granuloma was formerly described under the heading "human botryomycosis" by Poncet and Dor, who first described these little granulomata in man and claimed to have found the typical cocci (1879). Already in 1899, however, Sabrazès and Laubie denied a relation with botryomycosis and created the name telangiectatic granuloma. The staphylococci are chiefly found on the surface and not in the typical arrangement in globules. Nevertheless, recently authors again tend to accept the pathogenetic rôle of staphylococci, expressed in the name granuloma pyogenicum (Hartzell).

Though the histological picture of Poncet and Dor was afterwards corrected by other authors—they claimed to have found sweat-gland elements in these little tumours—the clinical picture they gave was frequently confirmed and now as many as 450 cases have been published.

In spite of the fact that in 75 per cent. of cases these little tumours are reported to arise after an injury, the wound itself is never persistent, as in an ordinary granuloma. Apparently the injury only means here an inoculation with the pathogenic agent. The wound itself and the reactions it gives evidently are of little importance; in 25 per cent. no injury at all is reported.

The telangiectatic granuloma develops as a generally solitary, pediculated, granuloma-like, easily bleeding tumour. It feels rather solid, at least, is not so soft as an ordinary granuloma. It may grow to the size of a pigeon's or chicken's egg in weeks, months or years and, though benign, shows a marked tendency to recurrence if not carefully excised.

It especially develops in the uncovered parts of the skin (9/10 of all cases). 1/3 is found at the fingers, 1/4 at the lips, and mucous membranes of the mouth. The diagnosis is easily missed and a malignant growth suspected. So Luchs of the department of pathology of the Freiburg University states that of 26 cases inspected there, in only one case was the diagnosis of granuloma made clinically. This and its still unclear aetiology, will be the

reason why, *e.g.*, in recent surgical literature, cases of telangiectatic granuloma are still described (Gerbatsch, 1932).

About a year ago I saw a typical case of telangiectatic granuloma of the eyelid (Fig. 1). A boy, aged about 16 years, when cutting wood, got a very superficial injury of the inferior eyelid. After about a week a fleshy tumour developed, a few days later there was some bleeding and the tumour fell off. Shortly after, however, it recurred and increased in size constantly and rapidly, while there was repeated nocturnal bleeding. The boy consulted his physician, who cut off the pediculated tumour, after treating the wound with lapis. This, however, did not put a stop to the process, as soon there was a recurrence with periodic nocturnal

FIG. 1.

haemorrhage and rapid growth. One night, when there was a more profuse haemorrhage than usual, he went to a clinic, where the bleeding was easily controlled by a simple bandage. The next day he was referred to the University Eye Policlinic. The photograph shows the pediculated tumour originating from the inner margin of the inferior eyelid. It most resembled a granuloma. As, however, malignancy could not be excluded the stalk was very carefully removed, so that macroscopically no tumour-tissue was left. There was no visible infiltrative growth in the normal surrounding tissue, to which the tumour was attached only superficially. Up till now (one year later) there has been no recurrence of the growth.

A survey of the tumour shows a framework of connective tissue, especially well developed in the stalk, but very soon disappearing as it radiates in the body of the tumour. Between the strands of connective tissue in the stalk and the part of the body adjacent to it there are dense masses of cells, amidst which numerous small lumina can be detected in many places. The greater—peripheral—part of the tumour, however, shows an astonishing abundance

of smaller and larger vessels with a scarcely visible wall spread in a tissue, almost resembling an embryonal vitreous body (Fig. 2).

A larger magnification shows that the dense masses of cells in the *proximal part* of the tumour consist chiefly of tissue cells (angioblasts, fibroblasts, connective tissue cells, and endothelia), while exudation cells (leucocytes, lymphocytes, plasma cells) are met with in a small number only, there being large areas where such cells are only occasionally seen. Here and there a haemorrhage can

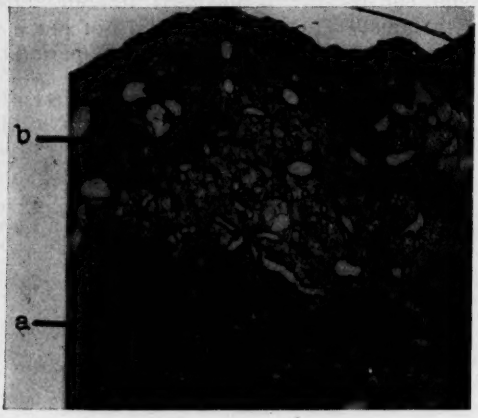

FIG. 2.

Part of tumour practically free from exudation cells. a Abundant tissue cells of central part. b Ectatic capillaries of peripheral part.

be traced, which may have been spontaneous or secondary to the trauma of extirpation. Numerous lumina are found in over 3/4 of this part of the tumour, partly as simple holes in the abundant protoplasm of the crowded cells. However, generally they show a lining of endothelial cells, often so abundant that it gives an impression as if they could scarcely find a place, their nuclei bulging in the lumen of the vessels. This part of the tumour is conspicuous for a blastomatous nature (angiosarcoma), but mitoses are found only occasionally.

The numerous vessels in the *peripheral part* of the tumour never show a distinct fibrous wall, though their lumina may be very considerable, the lining being chiefly endothelial. In many—especially the larger vessels—the endothelia become flatter and look like the endothelia we are familiar with in normal vessels. The tissue in which the vessels are spread is sometimes apparently structureless, generally distinctly fibrillar; mucus reactions were

negative. The majority of the cells scattered in the tissue are tissue cells, most authors considering them as angioblasts ("Capillarsprossen"), exudation cells are rare.

The tumour has an epithelial covering, for the greater part resembling that of the skin, only in a small area that of the conjunctiva, without mucous cells however. A few very deep and narrow "crypts" covered by epithelium are seen.

Apart from this "normal histology" of the tumour, certain secondary changes are present; haemorrhages, if from the large subepithelial vessels, sometimes perforating the epithelial covering, illustrating the clinical feature of recurrent haemorrhage; if

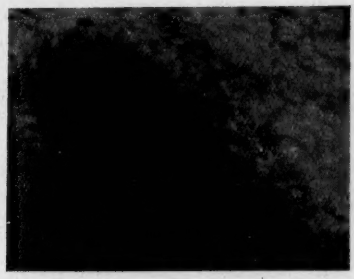

FIG. 3.

Globule containing cocci with a distinct capsule, which in this globule is continuous with a streak of homogeneous tissue of the tumour.

in the mass of the tumour itself, sometimes leaving a fibrinous network.

In many places the tumour is superficially ulcerated; here and there is evidence of inflammation in deeper parts of the tumour. Only superficially could I find staphylococci in great numbers, often arranged in globular masses. Here and there a distinct capsule could be traced, which probably must be derived from tissue elements (Fig. 3). Nevertheless, this structure recalls the findings in botryomycosis. Professor de Vries, pathologist in this University, showed me a case of septic endocarditis in which the arrangement of staphylococci in discs (probably globules) was seen, though no capsules could be traced. (Schmelzer describes a similar arrangement in his case of telangiectatic granuloma.)

The epithelium shows pathological changes of secondary importance (atypical stratum corneum, melting together of cells with hole formation), it may be absent.

This is a typical case of telangiectatic granuloma. Other cases

in the region of the eye were reported by Michelson: typical tumour of the skin of the inferior eyelid in a middle-aged woman; Tisseraud: raspberry-like growth of the size of a pea under the eyebrow in a boy 10 years of age; Luchs: tumour developing at a spot where the glasses were rubbing against the skin; Bargeton: broad pediculated tumour of the cornea after injury; Wohl: tumour of the external canthus, X-ray treatment during one year without success, extirpation, definite cure; Wescott: small tumour of the inferior eyelid, noticed during 10 weeks in a boy, aged 9 years; Torlais: pediculated tumour of the free margin of the inferior eyelid, a second case at the canthus internus after an injury; Schreiber: two cases at the margin of the eyelid; Anzilotti's case; Schmelzer's case.

In the lacrimal sac, cases were reported by Wagenmann, Piesbergen and Scheerer only, though tumours in these regions, labelled as granuloma or polyps, are reported "to resemble a haemangioma" in their architecture. And as we know that in the discussions as to the nature of telangiectatic granuloma some authors seriously discussed the possibility of angioma (Konjetzny, Lucien Picqué, Terrier) it is not unlikely that in these cases we have to deal with telangiectatic granuloma.

The histology of telangiectatic granuloma is not so typical as its clinical picture. French authors especially described cases with a very different histology, and Torlais in his compilatory article even gives a division into nine groups, of which I only mention here group 7: "sarcoid form with giant cells in ulcerated chalazion." Evidently French authors—among whom is Dr. Pesme of Bordeaux, to whom I am much indebted, as he was so kind as to send me reports of unpublished cases and brought to my knowledge the important article of Dr. Torlais—consider these tumours in a perforated chalazion not as simple granulomata, as we are accustomed to do. In my opinion such a point of view meets with considerable objections, though it might be difficult to make a differential diagnosis on certain parts of such a granuloma histologically only. Clinically, the telangiectatic granuloma is marked by its greater solidity, its tendency to bleeding and recurrence after simple removal. Histologically in telangiectatic granuloma the very thin vessel walls, the large areas showing no sign of exudation or inflammation, the (often partial, "collar-like") epithelial covering; in chalazion granuloma the infiltration of the thicker vessel walls (Fig. 4), and the predominance of exudation cells (plasma cells) generally allow a differential diagnosis.

The similarity of some of these tumours to angiosarcoma should be borne in mind, though it were only to prevent a disastrous mistake in the diagnosis. Some authors pointed out the similarity in histology to multiple tumours of the skin developing in certain

foreign diseases (Carrion's fever-Verrugia Peruviana, caused by a small rod in the red blood corpuscles (Bartonella), angiofibroma cutis circumscriptum (Bennecke). Recently Geiger in Vienna reported a remarkable case of multiple granulomata telangiectaticum developing after a fever of doubtful origin.

In a woman, aged 40 years, three days after the onset of an unclear fever multiple telangiectatic granulomata developed, which

FIG. 4.

Ordinary granuloma in chalazion. Shows the well developed vessel walls infiltrated with exudation cells. A large percentage of the cells seen are plasma cells.

showed a tendency to bleeding. The histology of the young tumours showed that inflammatory infiltrative processes were primary, the proliferative, ectatic changes leading to the growth of a tumour being secondary only.

Occasionally a rare organism may be found, *e.g.*, in a carefully studied case of granuloma of the conjunctiva the rhinosporium sebeerii was described; other organisms have been found by different authors—Amoebae (Létulle); "Fusarium Ponceti" (Guiart); a streptothrix (Archibald, and spirilla (Ponzin). This was not confirmed by other authors.

It is very remarkable that a great number of authors (including even Darier), follow Hartzell in his statement that the telangiectatic

granuloma develops under the influence of staphylococci (pyogenic granuloma), which again would link the granluoma to the botryomycosis, only in botryomycosis the cocci are found in the centre of the granuloma tissue, while in telangiectatic granuloma they are found superficially only. Geiger, on the other hand, has shown that in his case inflammatory processes were primary. Schmelzer's case of telangiectatic granuloma is remarkable for the appearance of multiple non-pediculated tumours (t.gr. is nearly always solitary) eight days after a cow's kick against the inferior eyelid, which suggests an animal source of infection. Though the cocci found were arranged partly in globules of about the size of a white blood corpuscle, Schmelzer denies the possibility of botryomycosis on account of the facts: primarily that there was no rapid growth in cultures under 37 degrees and no greater pathogenicity for caviae, features attributed to the botryococcus in differentiating against the ordinary staphylococcus. However, in the most recent veterinary publication Clarenburg en van Heelsbergen state, that the bacteriological d.d. against staphylococcus pyogenes aureus is very vague. Secondarily, that the cocci were found in the superficial parts of the tumour only, and, therefore, cannot be the pathogenic agent. As mentioned before, Hartzell and Darier accept the pathogenetic rôle of the staphylococcus in the telangiectatic granuloma and especially Geiger, in his case of multiple t. gr., stated that the inflammatory changes were primary in the process of its development.

Schmelzer's case faintly reminds us of the first and only case of human botryomycosis in the region of the eye described by Faber and ten Siethoff in 1898. The history of this case of botryomycosis is briefly as follows:—

A farmer consulted Faber. He said that four months ago his upper eyelid had been swollen. A tumour developed, that perforated and disappeared but at the same time there appeared a number of nodules in the region of the canthus externus and in the superior eyelid. Inspection showed that the conjunctiva palpebrae was swollen and reddened, there was papillary hypertrophy. These inflammatory signs, however, quickly receded on treatment with nitrate of silver. Besides his there was a number of greyish nodules, measuring from 0·5 to 3 mm. in diameter, which, as the conjunctival swelling diminished during the treatment, came more clearly into view. The larger ones perforated; there developed a small fistula, through which a slender probe could be introduced, leading into a small cavity. Faber diagnosed actinomycosis and sent material to ten Siethoff who was able to exclude the possibility of actinomycosis, but found peculiar conglomerates of spherical bodies resembling a bunch of grapes. On pressure

the thin capsule of the globular bodies burst and numerous cocci, not distinguishable from staphylococci appeared. Consequently he made the diagnosis of botryomycosis of the eyelid.

The similarity to botryomycosis of the conjunctiva in horses is striking when the description is considered of the only case I could find in the literature:—

Knapp describes a case in the conjunctiva of a horse, in which under the signs of inflammation small nodules developed in the conjunctiva. The diagnosis was confirmed microscopically. The secretion of the eye infected the surrounding skin and the lacrimal gland. The author mentions another case of conjunctival infection in horses.

As I could hardly believe the observation of ten Siethoff to be false, I looked for another case of human botryomycosis in the non-ophthalmological literature. I found the following cases:—

The closely investigated case of Kayser and Gryns, resembling a case of "Madura-foot." In the discharge from the fistulae they found little bodies, like grains of sand, consisting of conglomerates of globules and surrounded by a thick mass of white blood corpuscles, so that they were difficult to recognize. Under the microscope these conglomerates were freed from the exudation cells by means of a needle. Size of conglomerates 0·500 mm., of globules 8-200 micron., of cocci 0·6-0·8 micron.

Recently a similar case was published by Martinowa of Stalingrad.

Masson found the typical yellow grains containing the globular bodies in the discharge of bone fistulae in a war-wound and classified this inflammation as being of botryomycotic origin.

Stolz mentions four cases of osteomyelitis, in which the typical colonies could be found in the discharge from the fistulae and the granulation tissue as solid little grains of sulphur-yellow colour, resembling actinomyces.

Further cases I could not find, possibly because few are interested in this peculiar behaviour of staphylococci. The typical globules are not found by our common method of examining a discharge, for then the globules are ruptured and the cocci liberated; in cultures staphylococci develop, resembling the ordinary staphylococcus pyogenes aureus. We may conclude that probably either a special variety of staphylococcus or a special reactive condition of the human tissue may give rise in man to an arrangement of cocci in globules, similar to that found in animals in cases of botryomycosis. In contradiction to the statement of recent authors we must conclude, therefore that—though the published cases are very few in number—the possibility of botryomycosis in man has to be accepted. This botryomycosis is histologically and clinically a clearly defined disease.

Summary

Botryomycosis, chiefly met with in horses and apparently only occasionally occurring in man, is characterized by a chronic inflammatory development of granulation tissue and fistulae, causing tumours or swellings of the affected organ under the influence either of a special variety of staphylococcus or of a special reactive condition of the human tissue. Only one case of the eyelid is described. A few cases in other regions could be found in the literature.

Telangiectatic granuloma is clinically, a rather sharply marked off, not uncommon variety of granuloma in man. The aetiology is not sufficiently clear. A personal case of the eyelid is described, and cases from the literature collected.

LITERATURE

Faber.—*Centralb. f. pr. Augenheilk.*, J. XXI, p. 573, 1897; *Ann. d'Ocul.*, T. CXVII p. 56, 1897.

Geiger.—*Arch. f. Dermat.*, Vol. CLXI, p. 469, 1930; *Brun's Beitr. z. Gerbatsch. kl. Chirurgie*, Bd. CLVI, H. 4, 1932.

Kayser and Gryns.—*Geneesk. Tydschr. v. Ned. Indie*, Dl. XIII, 1907.

Knapp.—*Münch. tierarztl. Wochenschr.*, Jg. LXXXI, p. 505, 1930.

Luchs.—*Münch. Mediz. Wochenschr.*, Bd. LI, p. 1470, 1920.

Martinowa.—*Arch. f. Dermat.*, Bd. CLXI, p. 429, 1930.

Masson, C. R.—*Soc. biol.*, T. LXXXI, Janvier 26, 1918.

Michelson.—*Arch. of Dermat.*, p. 492, Vol. XII, No 4, 1925.

Piesbergen.—*Klin. Monatsbl. f. Augenheilk.*, Bd. LXVI, 1921.

Ponzin.—*Presse méd.*, p. 1242, 1927.

Scheerer.—*Klin. Monatsbl. f. Augenheilk.*, Bd. LXXXVI, S. 445, 1931.

Schmelzer.—*Klin. Monatsbl. f. Augenheilk.*, Bd. XCI, p. 470, 1933.

Schreiber.—*Krankheiten der Augenlider*, S. 206, S. 299, 1924, Berlin.

ten Siethoff.—*Ned. Tydschr. v. Geneesk.*, 34e Jg. 2e reeks, le. d., p. 440, 1898.

Stolz.—*Zentralbl. f. Bakteriologie.*, Bd. XCVIII, p. 473, 1930.

Tisseraud.—*Bull. soc. anat.*, T. XCIV, No. 10, p. 608, 1924, Paris.

Westcott.—*Jl. Amer. Med. Assoc.*, 24.6, 1916; *Dermat. Wochenschr.*, Vol. LXV, p. 2, 1917.

Wohl.—*N.Y. Med. Jl.*, 20.1, 1917. *Dermat. Wochenschr.*, Vol. LXV, p. 884, 1917.

Complete literature can be found in;

Torlais.—La Botryomycose chez l'homme et les animaux. *Arch. franç. de path. génér. et expér.*. Fas. III, 1922, Paris.

Hoffmann.—Handbuch der Haut und Geschlechtskrankheiten of Jahasohn. Bd. IX, Teil 1, p. 397, 1929.

OCULAR PEMPHIGUS

BY

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OCULAR pemphigus has been established as a clinical entity since 1858, when White Cooper, in the first volume of the Royal London Ophthalmic Hospital Reports, described a case. It is certain that prior to this date the disease occurred, but was confused with the various conjunctival degenerations known at that time, notably as conjunctival xerosis. Subsequent to this date the exact pathological differentiation of the condition occasioned dispute amongst dermatologists and ophthalmologists, a controversy which was engendered by the rarity of the disease, until von Graefe, in 1879, identified pemphigus with what had hitherto been called "essential shrinking of the conjunctiva."

Various authors (Pergens and others) have testified to the rarity of the condition; the average for eye cases is about 1 case per 20,000 and for skin cases 1 per 300 (Pusey). At Moorfields there have been four cases in the last five years.

Ocular pemphigus attacks the lids, conjunctiva, and cornea, the clinical picture often being composite. Parsons classifies the varieties of the disease as follows:—

(*a*) Acute, in which ocular involvement is coincident with a general eruption.

(*b*) Chronic, which occurs in four types.

- (*i*) Associated with vesicles on other mucous membranes, such as the nose, pharynx, larynx, vagina, or rectum.
- (*ii*) With vesicles on the skin.
- (*iii*) With vesicles only on the conjunctiva.
- (*iv*) Without history of previous vesiculation (essential shrinking).

Pathology.—As the name implies vesiculation should be a dominant factor of pemphigus (πέμφιξ, a blister), but it is a feature which is rarely seen in the ocular type. According to Uhthoff 1/7th of ocular cases show vesiculation, due to the fact, as Franke points out, that the mobility of the globe and lids would tend to prevent vesicle formation and precipitate early rupture of them.

The disease may be said to pass through three stages, namely vesiculation, cicatrization, and the final stage of complications. The stage of vesiculation has been described by various authors (White Cooper, Pergens, Whitham, Pusey), and the size of the vesicle appears to vary from that of a pea to a bean. Such vesicles may occur either on the palpebral or bulbar conjunctiva, the site

of election being at the inner canthus and at the centre of the lower conjunctival fornix (von Michel). In other cases, shallow ulcers have been noted at these situations (James) and in still more cases no ulceration or vesiculation has been found. On the skin of the lids the distribution is varied, the lower lid tending to be attacked more than the upper lid. Vesicles have not been described as occurring on the cornea and it appears that corneal changes are secondary. Adam stresses the fact that vesiculation alone is not the important factor in the formation

FIG. 1.

Section of Pemphigus Conjunctivae. There is epithelial hypertrophy with vesicle formation. The sub-epithelial layer shows much fibrosis and small round-cell infiltration. (Specimen from case 5, Fig. 2).

of subsequent cicatrices, but that epithelial hypertrophy and sub-adenoid infiltration are more potent causes, whilst Castello also emphasizes the importance of sub-epithelial contracture. The section shows this sub-epithelial infiltration and epithelial hypertrophy, but beyond this there is little to distinguish it from chronic granulation tissue.

The stage of cicatrization follows quickly on that of vesiculation. It is not so marked after an acute attack as it is after the more chronic variety. In the latter group firm bands of fibrous tissue are formed which pass from the palpebral to the bulbar conjunctiva (see Fig. 2), these eventually obliterate the fornices and impair the mobility of the globe. Later the lids and globe become firmly adherent in a mass of peri-corneal adhesions, which subsequently strangle the orifices of the lacrimal ducts and produce xerosis of the conjunctiva; ankyloblepharon is almost constant.

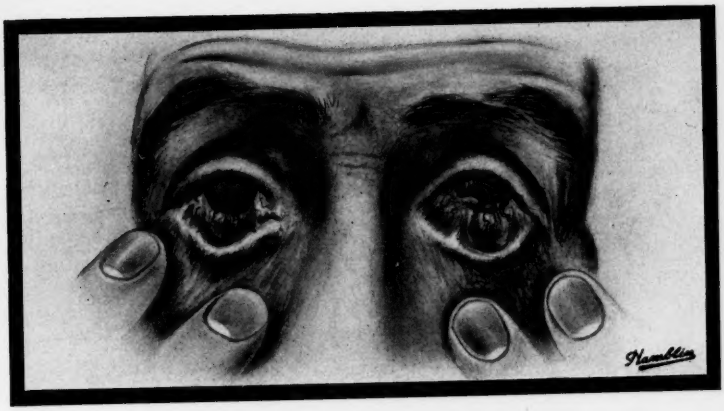

FIG. 2.

FIG. 3.

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The stage of complications is chiefly concerned with the state of the cornea following on xerosis. Coarse pannus frequently occurs and a xerotic plaque of fibrous tissue covered by a thin layer of epithelium invades the cornea, the lustre and transparency of the cornea thereby suffering, and blindness is the inevitable result (Fig. 3). Trichiasis and entropion may be responsible for a traumatic corneal ulcer which leads to suppurative panophthalmitis (case 2).

The age incidence of this disease varies, the acute variety attacking people from 2 to 35 years of age, the chronic variety those of from 40 to 70 years, and showing a preference for butchers and those engaged in the hide trade (case 5).

Bacteriology.—As in the case of skin pemphigus, the bacteriology of this disease is obscure and differs from skin pemphigus in that secondary conjunctival infection is always present. For many years the relationship to syphilis has been noted and de St. Martin particularly stresses such a relationship. There certainly appears to be a true bill for congenital syphilitic pemphigus of the skin, but this type rarely involves the conjunctiva. On the other hand, a positive Wassermann reaction is frequently coincident with ocular pemphigus (Zentmayer). Such cases have been reported by von Maren, Holtz, Stieren, Hardy and Lamb. Radcliffe Crocker compared the appearance of the cornea to that found in neuroparalytic keratitis and suggested that the cause was the action of a toxin on nerve centres. Conjunctival culture has yielded the usual secondary infections, notably bacillus xerosis and the staphylococci, whilst those who have been fortunate enough to obtain the fluid from a vesicle have on the one hand claimed to have isolated a large diplococcus, and on the other have proved the fluid to be sterile. Dejean has failed to confirm the presence of a specific organism which would reproduce the disease in animals.

The Relationship of Ocular Pemphigus to Skin Pemphigus

Dermatologists recognize the following varieties of skin pemphigus, namely, acute and chronic vulgaris, foliaceous and vegetans; the first and second types are liable to be accompanied by ocular pemphigus.

According to Walker, Demoine has isolated a coccus from the vesicle, but "the weight of evidence" is against any bacterial cause. One difference, which is probably due to the absence of secondary infection, is that healing in skin pemphigus takes place with very little scarring, although discolouration remains. Eosinophilia occurs in skin pemphigus; in case 5 there was a blood eosinophilia of 5 per cent.

Clinical types.—Acute pemphigus is fortunately the rare type

since it is usually fatal. It attacks young people of both sexes and is said to be associated with undue exposure to sunlight. Commencing with a rigor there follows a bullous eruption in which the lids and conjunctiva become much swollen, although the cornea is rarely involved directly (Strader). With a rupture of vesicles there follows mild cicatrization in the conjunctiva, but deterioration of vision seldom results to any serious degree. Cases of this class have been reported by Martin and others.

Chronic pemphigus begins with all the usual symptoms of chronic conjunctivitis and is frequently undiagnosed, or diagnosed as trachoma or tubercle of the conjunctiva. A specific ropy discharge has been noted by a few authors. In the minority of cases vesicles give the clue to the disease, but the majority are diagnosed either by the reluctance of a conjunctivitis to clear up or by the manifest presence of cicatricial conjunctival bands. Coincidently a nasal discharge or a husky voice leads to the discovery of vesicles or ulceration in the nares, nasal pharynx, or larynx.

Differential diagnosis.—From the ocular standpoint pemphigus may be confused with extensive conjunctival burns in which the history will be of assistance, from malingering when the condition will be more likely unilateral; or with tubercle in which cicatrization of this degree rarely occurs. Trachoma may be a stumbling block (Wood), but ankyloblepharon, which is constant in pemphigus practically never occurs in trachoma, and, moreover, the lower fornix is also the site of election in pemphigus and follicles are absent. Primary xerosis of the conjunctiva does not present the same intense cicatrization as does pemphigus, and its epidemic nature and presence of night-blindness will be of assistance in determining the true cause. Syphilitic tarsitis in the later stages may occasion confusion, but here also cicatrization is not a prominent factor.

From the dermatological standpoint conjunctival vesicles, together with vesiculation of the body elsewhere, must be differentiated from erythema multiforme of the bullous type, which, however, rarely attacks the mucous membranes, from dermatitis herpetiformis in which bullae tend to occur in successive crops, and from the bullous impetigo and bullous syphilides, which occur at a much younger age than does true ocular pemphigus. Drug eruptions should also be borne in mind.

The following cases demonstrate varieties of the disease:—

Case 1.—Female, aged 40 years, has had "sore eyes" for six months. External examination shows total symblepharon below with trichiasis and corneal ulcer in the left eye.

This case had pemphigus vulgaris of the skin two years previously. Treated by epilation, guttae paroleine and thyroid; no improvement.

Case 2.—Male, aged 65 years, has been treated at another hospital for conjunctivitis by silver applications for nine months. Both lower fornices obliterated and bilateral corneal ulceration. Treated by "Germinine," atropine, epilation. Suppurative panophthalmitis followed on corneal ulceration and the right eye was removed.

Case 3.—Female, aged 72 years, diagnosed and treated as late trachoma for over a year. The right eye showed total symblepharon with trichiasis. Treated by argyrol, epilation and lotions. Subsequently developed extensive corneal ulceration in both eyes which were enucleated.

Case 4.—Male, aged 70 years, painter and decorator. Nine years ago "patch" appeared on the left eye. One year six months ago the right became irritable and the left eye one month later. Epilation was repeatedly carried out. There has been intermittent throat trouble, and "blisters" in the mouth were found after the onset of the eye condition. There has also been nasal discharge. No history of vesicles of the skin. No previous eye trouble. Symblepharon right and left eyes; aberrant lashes; no xerosis; corneae relatively uninvolved. There are many ulcerated areas on the fauces, gums, and lips, also a central ulcer of the hard palate. Wassermann reaction negative. Treated by vaccines. This case has not been treated by radium.

Case 5.—Male, aged 55 years, butcher. The left eye became irritable two years ago, and the right eye six months later. History of "blisters" in the mouth at the time. No recent illness; no previous skin trouble; no accident or injury to the eyes; no eye trouble in the family. No previous eye trouble. No history of conjunctival blisters. Right eye: upper and lower symblepharon; aberrant lashes. Left eye: symblepharon; pannus; aberrant lashes; no xerosis. Cultures: B xerosis; staphylococcus aureus; Wassermann reaction negative; eosinophilia 5 per cent. Treated by surface application of radium; six hours' duration; 10 mgm. radium, 1 mm. silver screen. There have been three applications and the condition has improved.

Treatment.—The treatment of ocular pemphigus makes a doleful story. Almost every remedy in fashion has been employed, but the results have been consistently bad. Local collyria are of no specific avail; for the alleviation of symptoms paroleine has been found to be of greatest benefit. Surgical intervention by mucous membrane grafts has had limited success. According to Wood the most satisfactory surgical measure is tarsorrhaphy. Autohaemotherapy, turpentine injections (Gewalt) and pyretotherapy have had their day with little improvement. As a result of limited experience the author would suggest the following treatment in cases of chronic ocular pemphigus:—

(1) Local instillations of paroleine daily.
(2) Median tarsorrhaphy.
(3) Regular epilation.
(4) Surface radium application.

By courtesy of Dr. Durden Smith radium treatment was carried out in case 5 at the Radium Institute, the method of application being by the use of 10 mgm. radium with 1 mm. silver screen over the closed lids for six hours' dose; this to be repeated at two monthly intervals. This case has certainly improved as a result of these measures, but whether it is due to the reduction of vascularity and redundancy of the mucosa or to true cure is doubtful. General measures have included the administration of arsenic and vaccines.

The prognosis remains today, in spite of an increased armamentarium of therapeutic measures, much as it was in the days of White Cooper. All authors are agreed on the resistance of this condition to all and every mode of treatment and to the inevitable steady progression toward blindness. Writing in 1858, White Cooper naively remarked that "to combat this condition ingenuity was severely taxed." It is a regrettable fact that in common with other methods of taxation there does not yet appear to be any estimate in the therapeutic budget which will reduce this taxation and lower the deficit of incurable diseases of which ocular pemphigus is a heavy burden.

My thanks are due to the Honorary Staff of Moorfields for their ready permission in allowing me to investigate their case records, and to Mr. F. W. Law, Pathologist at Moorfields, for pathological facilities.

BIBLIOGRAPHY

ADAM, C.—*Zeits. f. Augenheilk.*, Vol. XXIII, p. 35; *Berlin Ophth. Gesell.*, July 2, 1908.
ALGER, E. M.—*Arch. of Ophthal.*, Vol. XLVII, p. 423, 1918.
AMBERG.—*Zeits. f. Augenheilk.*, Vol. XVII, p. 417.
ANDERSON.—*Trans. Ophthal. Soc. U.K.*, Vol. XXIV, p. 19, 1904; *Ophthal. Rev.*, p. 58, 1904.
ANDERSON, W.—*Trans. Ophthal. Soc. U.K.*, December, 1903.
BANE.—Colorado Med., Vol. VI, p. 243; *Ophthal. Rec.*, p. 197, 1908; *Amer. Jl. of Ophthal.*, Vol. V, p. 221, 1922.
BARLAY.—*Orvosi Hetilap. Szemesze.*
BAUMLER.—*Klin. Monatsbl. f. Augenheilk.*, 1885.
BICHATON.—*Arch. Internat. de Laryngol.*, Paris, Vol. XXV, p. 1080, 1908.
BIETTI.—*Ann. di Ottal.*, Vol. XXXIX, p. 637.
BLAIR.—*Ophthal. Rev.*, Vol. XXVIII, p. 213, 1909.
BORDLEY.—*Ophthal. Rec.*, Vol. XXII, p. 545.
BOUCHART, A.—*L'Ophtal. Prov.*, May, 1911: *Ophthal. Rev.*, Vol. XXX, p. 244.
BOURGEOIS.—*Recueil. d'Ophtal.*, p. 93, 1911.
BOUVIN.—*Nederl. Tijdischr. v. Geneesk*, Vol. II, p. 969.
BRENING.—*Deutsch. med. Wochenschr.*, February 7, 1921.
BROWN.—*Annal. of Ophthal.*, p. 535, July, 1904.
BUNSE.—Ueber den Pemphigus der Bindehaut. *Inaug. diss.*, Berlin, 1910.

BURK.—*Klin. Monatsbl. f. Augenheilk.*, LI, Bd. XVI, S. 761.
CASALI. *Ann. di Ottal.*, Vol. XL, p. 481.
CASTELLO, B.—*Ann. di Ottal.*, Vol. LV, pp. 405-411, May-June, 1927.
CLAPP, C. A.—*Amer. Jl. of Ophthal.*, Vol. VIII, p. 649, 1925; Sect. Oph., Baltimore, February 22, 1928.
COCKS.—*Jl. Amer. Med. Assoc.*, Vol. XLVII, p. 1736.
COHEN, M.—*Arch. of Ophthal.*, Vol. XLVI, p. 65
COHEN, P.—*Zeits. f. Augenheilk.*, Berlin, Vol. X, S. 421-425.
CONLON.—*Boston Med. and Surg. Jl.*, Vol. CLXXVII, p. 206.
CONNOR, R., and BUCKHOLDER, C. A.—*Amer. Jl. of Ophthal.*, Vol. I. 1918.
CONSTANS, G. M.—*Amer. Jl. of Ophthal.*, 1927.
COOPER, WHITE.—*Roy. Lond. Ophthal. Hosp. Reps.*, Vol. I, pp. 155-157, 1857-59.
COPPEZ. *Bull. de la Soc. belg. d'Ophtal.*, 1905.
CZERMAK, W.—*Prag. med. Wochenschr.*, Nr. VIII, S. 104, 1905.
DARTIGALONGUE.—*Thése de Bordeaux*, 1903.
DARIER, A.—*La Clin. Ophtal*, Vol. XXVIII, pp. 619-630, 1924.
DEJEAN, C.—*Ann. d'Ocul.*, Vol. V, p. 165, 294, 1926.
DUNPHY, E. B.—*Amer. Jl. of Ophthal.*, Vol. XII, p. 494, 1929.
FEHR, O.—*Berlin Ophthal. Gesell.*, February 23, 1911; *Ophthal. Rev.*, Vol. XXX, p. 156.
FRANKE, E.—Der Pemphigus und die essentielle Schrumpfung der Bindehaut des Auges. 1900, Wiesbaden.
FREUND, E., and VISSI, F.—*Giorrital di dermat. e sif.*, Vol. LXXIII, pp. 212-217, 1932.
FUCHS, E.—Text Book.
GEWALT.—*Deutsch. med. Wochenschr.*, January 27, 1921.
GOLDENBERG, M.—*Amer. Jl. of Ophthal.*, Vol. X, p. 250, 1927.
GOLOWIN.—*Ophthal. Gesell. Odessa*, November, 4, 1903.
GROENOUW.—*Graefe-Saemisch*, Bd. V, Abt. 1, Kap. IV, S. 578.
GRUBERT.—*La Clin. Ophtal.*, July, 1925.
GUZMANN.—*Zeitschr. f. Augenheilk.*, Vol. XIX, p. 387.
HARDY, W. F. and LAMB, H. D.—*Amer. Jl. of Ophthal*, Vol. XXXIV, p. 289, 1917.
HARRY, P. A.—*Prescriber*, Vol. X, p. 165.
HEPBURN.—*Ophthal Rev.*, p. 52, 1906.
HERZFELD.—*Berl. klin. Wochenschr.*, S. 1949, 1908.
HESSE.—*Wien. klin Wochenschr*, Vol. XXVIII, S. 62.
HOLLANDER, L.—*B. J. Derm.*, pp. 39, 450, 1927.
HOLMSTROM, J.—*Hygia*, July, 1902.
HOSFORD.—*Ophthal Rev.*, p. 250, 1907.
JAMES, W. M.—*Amer. Jl. of Ophthal.*, Vol. XV, pp. 815-820, 1932. Washington Eye Hospital.
JOHNSTON.—*Jl. of Eye, Ear and Throat Diseases*, p. 59, 1904.
JULER.—*Proc. Roy. Soc. Med.*, Vol. XVII, pt. 3. *Ophthal.*, p. 48, 1924; *Trans. Ophthal. Sect. Roy. Soc. Med.*, March 14, 1924.
KOEBER.—*Centralbl. f. prakt. Augenheilk.*, December, 1905.
KRIES.—*Arch. f. Ophthal.*, 1878.
LANDOLT, E. and F.—*Arch. d'Ophtal.*, Vol. XXX, p. 337.
LANNOIS and CURTIL.—*Ann. de mal. de l'Oreille, du larynx, etc., Par.*, Vol. XXXVI, pt. 1, pp. 252-255, 1910.
LUDDONI, G.—*Ann. di ottal. e clin. ocul.*, Vol. LVIII, p. 505-617, 1930.
MACLEOD, J. M. H.—*Dis. Skin*, 1921.
MAKLAKOW.—*Vestnik Oftal.*, Vol. XXII, p 9.
MANES, A. J.—*Dia. med.*, Vol. III, p. 863, 1931.
MARTIN, DE ST.—*Ann. d'Ocul.*, Vol. CLVIII, pp. 238-349, 1921.
MARTIN, W. O.—*Arch. f. Ophthal.*, Vol. III, pp. 744-747, 1929.
MENEAU.—*Jl. de mal. cutan. et syph. Par.*, Vol. XVII, p. 159, 1905.
MICHEL, V.—*Centralbl. f. Augenheilk.*, S. 360, 1909.
MITCHELL, H. L.—*Virginia M. Monthly*, Vol. LIX, pp. 302-303, 1932.
MOHR.—*Ueber Pemphigus der Conjunctiva und anderer Schleimhaute.* Gyogyaszat, Nr. 5, 1904.
MONESI.—*Ann. di Ottal.*, Vol. XXXVIII, p. 620.

MONESI, L.—*Recueil d'Ophthal.*, Vol. XXXII, p. 167.
MORRIS and ROBERTS.—*Brit. Jl. Dermat.*, p. 175, 1889.
NATHAN.—*Berl. klin. Wochenschr*, Vol. LII. S. 1183.
NETTLESHIP, E.—*Trans. Ophthal. Soc. U.K. London*, Vol. XXIV. pp. 22-24, 1904.
NEUSCHULAR, I.—*Boll. d'ocul.*, Vol. X, pp. 1-10, 1931.
OGILVY.—*Arch. of Ophthal.*, p. 227, 1905.
OGUI and IMAI.—*Nippon Gank., Zasshi*, 1914.
OKUSE.—*Nippon Gank., Zasshi*, November, 1915; *Ophthal.*, Vol. XII, p. 794.
ORMOND.—*Ophthal. Rev.*, Vol. XXXI, p. 383.
PARSONS, J. H.—*Pathology of the Eye*, Vol. I, pp 89-91, 1904.
PELS.—*Arch. Derm. and Syph.*, Vol. XIX, p. 640, 1929.
PERGENS.—*Pemphigus des Auges*, 1901.
POKROWSKY.—*Klin. Monatsbl. f. Augenheilk.*, Vol. LII, p. 897.
POSEY, W. C.—*Ocular Pemphigus*, Vol. III, p. 507, 1920; *Amer. Jl. of Ophthal.*, July, 1920.
PUSEY.—*Principles and Practice of Dermatology*, 1917.
QUINT.—*Klin. Monatsbl. f. Augenheilk.*, Vol. XLVI, Bd. V, S. 313.
RABINOWITSCH.—*Westv. Ophthal.*, Vol. XXII, Sept., 1905; *und ebd. Dez*, 1903; *Odess. Ophthal. Gesell.*, 1910.
DE SAEMISCH, ROSA.—*Sub. pemfigo oculare, Napoli*, 1927; *Graefe-Saemisch*, Bd. XI, I *Abt.*, XXII *Kap*, S. 211.
SALVA.—*La Clinique Ophtal.*, pp. 235-290, 1904.
SCHIESS,—*Jahresb. d. Augenheilanstalt zu Basel*, 1889.
SCHILLER, F.—*Zeits. f. Augenheilk.*, Vol. XXIV, p. 363.
SCHMIDT-RIMPLER.—*Münch. men. Wochenschr.*, 1905, S. 673.
SCHÖLER.—*Centralbl. f. prakt. Augenheilk.*, January and February, 1904.
SEQUEIRA, JAMES.—*Dis. Skin*, 3rd Ed., 1919.
SHERMAN, E. S.—*Arch. of Ophthal.*, Vol. XXXIX, p. 140; *Sect. Ophthal. N.Y. Acad. Med.*
SHUMWAY, E. A.—*Ophthal. Record*, Vol. p. 236.
SNADER, G. L.—*Amer. Jl. of Ophthal.*, Vol. IX, p. 382, 1926.
SPECIALE-CIRINCIONE.—*Clin. Ocul.*, Vol. XV, p. 281.
STELLWAG.—*Lehrbuch d. Augenheilk.*, 6th Ed., 1870.
STELWAGON.—*Diseases of the Skin*, p. 358, 1911.
STIEREN.—*Trans. Amer. Ophthal. Soc.*, Vol. XIV, p. 302.
SWEET.—*Ophthal. Record*, p. 79, 1906.
TERRIEN, GOURGEROT and HASSON.—*Arch. d'Ophtal.*, Vol. XLVIII, p. 275, 1931.
TRAUTMANN.—*Zur differential Diagnose von Dermatosen und Lues*, 1903.
TRUMPY EINAR.—*Norsk. Laegevidebsh.*, Vol. LXXXIX, pp. 27-31, 1923; *Als. j. Asia*, Vol. LXXX, p. 112, 1923.
UHTHOFF.—*Deutsch. med. Wochenschr.*, S. 1841. 1907.
VAUCLEROY.—*Rev. gén. d'Ophtal.*, p. 55, 1905.
VILLARD, H., DEJEAN, C., and DUPONNOIS, J.—*Bull. Soc. d'Ophtal.*, Vol. XLII, pp. 358-363, 1930.
VON MARENHOLTZ.—*Zeits. f. Augenheilk.*, Vol. XXVIII, p. 550.
WALKER.—*Introduction to Dermatology.*
WALLENBERG.—*Klin. Monatsbl. f. Augenheilk.*, Bd. X, p. 495.
WEEDLER, W. B.—*Sect. Ophthal. N.Y Acad. Med.*, November, 1910.
WEEKS, J. E.—*Sect. Ophthal. N.Y. Acad. Med.*, April, 1913.
WEIDLER.—*Jl. Amer. Med. Assoc.*, p. 1016, 1912; *Arch. of Ophthal.*, Vol. XLVI, p. 169.
WHITHAM.—*Trans. Amer. Ophthal. Soc.*, 1919: *Arch. of Ophthal.*, Vol. LI, p. 388, 1922.
WIBO.—*Jl. Med. de Bruxelles*, p. 364, 1904.
WÖLLNER.—*Inaug. Diss. Eraugenheilk.*, Bd. IX, p. 398, 1910; *Klin. Monatsbl. f. Augenheilk.*, Bd. IX, p. 398, 1910.
WOOD, D. J.—*Brit. Jl. of Ophthal.*, p. 123-124, 1921; *Brit. Jl, of Ophthal.*, March, 1921.
WOOTTEN, H. W.—*Arch. of Ophthal.*, Vol. LII, p. 270, 1923.
ZENTMAYER, W.—*Amer. Jl. of Ophthal.*, Vol. IX, p. 202-4, 1926.

SIMULTANEOUS BILATERAL RODENT ULCER OF CORNEA, CURED BY COMBINED CURETTING, THERMOCAUTERY AND MASSIVE CYANIDE SUBCONJUNCTIVAL INJECTION

BY

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DUE to the rarity and obstinate resistance to treatment of the disease as above titled, it seems a suitable subject to bring before the profession to elicit expression by those of larger experience both as to diagnostic limitations, and means for its cure. From what I have been able to read, all commentators agree as to its origin at the corneal margin, and its slowly progressive destruction of the corneal surface, leaving opaque cornea when it heals, and seldom, if ever, penetrating the entire cornea. Yet some speak in terms as though marginal ulcer, ulcus serpens, etc., are to be confused with rodent ulcer or Mooren's ulcer, as it has been more frequently called since this oculist brought it into conspicuous notice. Reading some high authorities one might think all that was necessary to cure it was a single use of actual cautery; but reading case reports shows how certain ulcers have gone ruthlessly on in spite of many cauterizations, as well as other orthodox methods, to a long drawn-out and tragic destruction of one, and sometimes later on, the other eye of its victim.

The first exhaustive description of rodent ulcer, with compiled literature on the subject, to come to my observation, was the paper by the late Dr. Randolph presented before the eye section of the *Amer. Med. Assoc.*, and published in the transactions for 1909, p. 308. Even after reading that, it was lost to memory until a year or two later. My first case was encountered in the person of an elderly Italian man. It was only after failure of expected benefit from usual treatments that the Randolph paper was thought of. The patient in the meantime decided to return to his native land, so that further efforts were ended. He was told to go to an oculist in the nearest city to his home, which happened to be Turin. In the more than 20 years since then, a small number of what were judged to be rodent ulcers in one eye only have been successfully treated by the measures hereinafter to be described. Dr. Bedell has a report, with later literature, of two cases, both ending in loss of eyes, in the *Amer. Jl. of Ophthal.* for April, 1933, p. 289. The stereoscopic picture he exhibits is exactly like the case later to be presented as to the size, location and shape of ulceration. A recent paper by Dr. Sandford Gifford, reporting

three cured cases in the *Arch. of Ophthal.* for December, 1933, p. 800, gives a much more roseate prognosis than heretofore justified.

In the *Arch. of Ophthal.* for May, 1934, p. 832, a case is reported by F. W. Dean, of a patient losing one eye from Mooren's ulcer in spite of all the then taught methods of treatment. A short while after the remaining eye became affected, and was progressively growing worse in spite of everything, when the idea of attacking the engorged conjunctival area by cautery and curetting, and then covering the affected area by a sliding conjunctival flap, proved the key to a successful cure.

The suddenness with which the condition can arise, as demonstrated by my patient's second eye, inclines me to believe that the origin is neuropathic. Likewise the corneal anaesthesia, persisting a month after healing does the same. Time had not allowed the extensive undermining of the sclera depicted in the Randolph illustration, but there were heavy, thick vascular pads extending on to the adjacent sclera, which bled profusely when they, along with the ulcerated cornea, were vigorously curetted.

Mrs. M., aged 60 years, a large, robust country woman, presented herself on May 25, 1933, complaining of a hot, burning, and slightly painful feeling of only a few days duration in her right eye. The conjunctival vessels were everywhere engorged, and the upper cornea near the limbus resembled a heavy arcus senilis. This did not stain green with fluorescein, but a dirty yellow. The scleral area adjacent was, as before mentioned, a thick vascular pad. Neither then nor at any subsequent time, was there evidence of iritis, as measured by appearance or tenderness to touch. The supposed nature of the disease was explained to her, with the necessity of vigorous measures of treatment required. But it was decided to try one simple treatment of rubbing the ulcer with cotton-wound tooth-pick moistened with carbolic acid, and argyrol eye drops. The patient was permitted to go to her home in the country for two days with the understanding that active measures were to be used on her return, if the conditions were no better. She was taking occasional treatments with slight restrictions on diet, from a general physician. Inquiry of him elicited the information that all he could find amiss was a slight rise in blood pressure, and occasionally a little albumin in the urine. On her return on May 27, the ulceration was extending. After cocainizing the eye, novocaine was injected subconjunctivally for anaesthesia. With a small mastoid curette, the ulcer and adjacent sclera were forcibly curetted, with profuse bleeding resulting, until a trough almost the entire thickness of cornea about three millimetres wide at the middle, and about one-fourth of the circumference was made. This trough, in its entire area, was seared with a heavy paddle-shaped

post-thermocautery, and a massive subconjunctival injection of cyanide of mercury (2 c.c. of 1/1,500 sol.) immediately given. After giving this injection, the eye is always left unbandaged for half an hour or so, to let the patients or their relations see that the enormous swelling of the lids and conjunctiva which has been expected and desired has taken place. The eye is then bandaged, and the pads changed daily as long as the profuse serous discharge continues. According to the rule it is usually several days before chemosis subsides sufficiently to see the cornea to its upper limit. When this stage arrived with the patient, it was a question as to what was going to be the outcome. For several days it was feared that the ulceration was progressing at the nasal end, and that more cauterization would be required. The burned area now showed green staining with fluorescein. In a few more days the ulcer began healing at its extremities, and in a few weeks entirely epithelialized over, with only a faint haze in the new-formed corneal tissue which filled out the deep trough to its normal curvature. The preceding describes the course in the right eye. When it was treated on May 29, there was no trouble with the left, and the patient was told she need not come on Decoration day, May 30. On that afternoon, however, she saw her physician, who looked at her eyes and observed nothing amiss with the left. When she came to me on the morning of May 31, the left eye had exactly the same feeling and appearances as did the right when first seen. The ulcer was touched with phenol, and notice given that if it extended the same measures would be adopted, as were used with the right, which were carried out in the same manner on June 1. This eye healed as did the first, without giving any anxiety as to its extending or the likelihood of it needing further cauterizing. The patient came daily, with a few exceptions, throughout June. During this period the cornea of each eye was anaesthetic to the touch of a cotton thread. There was very little discomfort in the eyes and the only protection was dark glasses when in bright light. While there was no sign of iritis, atropine and argyrol were put into the eyes at her daily visits, after washing out with boric solution. Tension was taken by fingers daily; I also used viosterol daily which for several years I have instilled in eyes, whose corneal nutrition it was desired to raise, but of course I would not be capable of having an opinion from such limited observation. Since beginning this practice I read mention at a Belgian society of its use under their name for it, to prevent symblepharon after burns; and some of the authors or discussers of rodent ulcer papers have also recommended it. Throughout July she came for observation at increasingly long intervals of one or two weeks, and was fully released on August 11, with perfect sensation returned to the corneae, full near vision with

glasses, and 20/40 in each eye. She had quite a large hyperopia with astigmatism, which had never been corrected, and more or less amblyopia exists almost always under this condition. She says her eyes seemed in every respect as good as any time in her life, except for presbyopia. In each eye the trough made by curetting had filled out, the corneal haze had gone, the cornea was absolutely clear, and nothing left to remind her of what had been, except a memory. In the discussions to which reference is made in the papers quoted, one of the discussers said: "If the eye recovered, then it was not rodent ulcer." Dr. Gifford negatived this by the heretofore mentioned paper in the *Arch. of Ophthal.* "Rodent or Mooren's Ulcer of the Cornea. Report of three cases with healing." The most notable result of the treatment used in my case, is the perfect transparency of the regenerated cornea. Regardless of the naming of the disease, I wish again to call attention to the fact that in any extensive ulceration of the cornea in which massive cyanide injections are made, the opacity of the regenerated tissue is much less than in similar conditions where the injection is not made. In a paper read by the writer before the Academy of Ophthalmology and Oto-Laryngology, published in the Transactions for 1915 on p. 206 occurs the following:—

"In the graver forms of corneal ulceration, injection is the most potent means of control we possess, either alone, or in conjunction with the usual treatment employed, such as iodine, carbolic acid, actual cautery, curetting, paracentesis, or iridectomy. The clearness of scar tissue is a striking feature, as compared to what is otherwise usual. Instances have been observed where quite efficient vision was restored, where ordinarily leucoma would have precluded this possibility. In those rapidly destructive ulcerations due to suppuration of the tear-sac, it is my practice to open the tear-sac, destroy it completely by the electro-cautery, burn the ulcer with the same, and then give an injection—all at one sitting. When done sufficiently early, the result is all that could be desired; a day or two of delay will make it too late. In one case of typical rodent ulcer of the cornea, injection, with antiseptics utterly failed. Three subsequent eyes with rodent ulcer were curetted, burned with the cautery and injected at the same sitting, and healed as promptly and smoothly as the simplest forms of ulcer. They had the ulceration extending well into the sclera, which is the characteristic feature for diagnosis. These cases are reported to bring out the advantages of adding injections to routine measures, in cases where those measures alone, and injections alone might both fail. In the annals of *Ophthalmology* for July, 1915, a case is cited of a cure of an extensive retinal detachment by combined subconjunctival injection and galvano-puncture of sclera."

A CASE OF PRIMARY ERYSIPELAS OF CONJUNCTIVA BULBI*

BY

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HAIFA, PALESTINE

IT is probable that cases of primary erysipelas of the conjunctiva bulbi occur very seldom. I have not found any mention of such cases in books on infectious diseases, where much space is devoted to primary erysipelas of mucous membranes (Struempel, Kraus and Brugsch). In the widely used books on eye diseases (May, Morax, Fuchs, Axenfeld) much space is given to different secondary complications of the eyes during primary erysipelas of face and eyelids, but the possibility of primary erysipelas of the conjunctiva bulbi is never mentioned. Terrien and Coussin, who collected the literature on this question up to 1923, paid considerable attention to eye complications accompanying erysipelas of the face and of the eyelids, but they made no mention of the possibility of primary erysipelas on the conjunctiva bulbi. Only Groenouw, who collected the literature on erysipelas of the eye from 1857 to 1918, mentions that "sometimes primary erysipelas starts from lachrymal ducts or from the conjunctiva" (p. 893). In the accessible periodical journals of recent years I have not found any information on this question.

Therefore I think it advisable to publish the first symptoms and the course of this rare disease which was investigated by me from beginning to the end. The diagnosis of the case was clear only 24 hours after the first examination of the patient, when *per continuitatem* erysipelas had passed on to the eyelids and face. The patient died unexpectedly on the fifth day of his illness from sudden cardiac failure.

History of the illness:—A man, aged 45 years. On 5th March, 1934, the patient was travelling in a train, when between 8 and 10 a.m. a foreign body came into his left eye. The patient rubbed his eye with a handkerchief, tears appeared and after a short time the symptoms subsided. The patient had been suffering continually from rheumatism and in his childhood had had several infectious diseases. In 1932 he had erysipelas faciei starting on the nose, and before that he had had erysipelas of the hand.

At about 11 p.m. on March 5, during a game of chess, he again complained of pain in his left eye, which grew worse every minute. Shortly afterwards pains on the left side of the head were added to those of the eye. These proved to be unbearable and they forced the patient to ring me up at 3.30 a.m. and ask for an immediate consultation which was fixed for 6 a.m.

March 6, 1934, 6 a.m.—The patient moaned and shivered on account of the severity of the pains. Spastic blepharospasm of the left eye. After one drop of 1 per cent.

*This paper was read at the meeting of the Jewish Medical Society in Haifa on March 20, 1934.

pantocaine had been twice applied to the left eye, the patient opened the lids and stated that the pains in the eye and in the head had ceased. Examination of the left eye showed that the skin and the edges of the eyelids and also the naso-lacrymal ducts were normal. There was a slight hyperaemia of the palpebral conjunctiva, which is usually seen in pantocaine anaesthesia (Shimkin).

On the upper half of the conjunctiva sclerae, 1 cm. above the corneal limbus, there were observed punctate haemorrhages resembling scratches on the conjunctiva due to some sharp and hard foreign body (when examined by Hartnack's magnifying glass). On the medial edge of the cornea in the region of the rima palpebrarum, was visible a limited oedema, such as is observed near the limbus at the time of a subconjunctival injection of 0.1 c.c. of any sterile and transparent liquid. The remaining surface of the conjunctiva bulbi was normal (see Fig. A). Tension = 16 Schiötz). The pupil reactions and the fundus oculi were normal.

8 *a.m.*—Unbearable pains in the left eye and on the same side of the head, which only ceased for a short time after instilling 2 per cent. cocaine hydrochloride. On the conjunctiva sclerae instead of punctate haemorrhages there were three big ecchymoses measuring 2.5—4 mms. in diameter. The conjunctival oedema extended round 4/5 of the surface of the cornea (see Fig. B). Tension, fundus oculi, normal; pupillary reactions normal. Pulse 68; temperature 36°C.; lungs and heart normal.

4.30 *p.m.*—Patient had a rigor. Temperature 40°C.; heart, lungs, spleen, liver normal.

6 *p.m.*—Very severe pains in the left eye and in the head on the same side. The conjunctiva round the cornea in the place of the former oedema was full of ecchymoses of dark blue colour protruded outside and nipped between the tightly-squeezed eyelids (see Fig. C). In the conjunctival sac there was a minute quantity of fibrinous secretion which was taken for a microscopic examination. There was no detectable abnormality of the eyelids, of the mobility of the eyes, of the fundus oculi or of the tension.

March 7, 8 *a.m.*—Skin erysipelas of the external edges of the orbit and both lids of the left eye. The eyelids were swollen, red and tender when touched, and opened with difficulty. The pains in the left eye and in the left half of the head were greatly diminished. The spleen was enlarged. No further abnormality detected. Fibrinous secretion in the left conjunctival sac was more abundant than the day before. Smear was taken for microscopic examination.

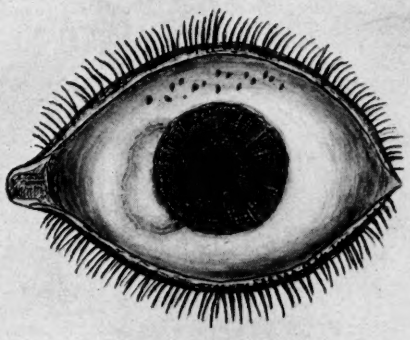
March 8, 8 *a.m.*—Temperature 40°C. Right eye: Erysipelas palpebrarum. Left eye: Erysipelas bullosum on the internal edge of the lower left eyelid. A transparent liquid was taken from the punctured bulla for microscopic examination The patient complained of the sight of his left eye continually becoming worse. The pains in the left eye and in the left half of the head were very insignificant. A pseudo-membrane of fibrinous character was formed on the conjunctiva bulbi, which covered the cornea; this membrane was easily removed by a damp swab. This was taken for a microscopic examination. The cornea was slightly swollen, not transparent and therefore the fundus was not clear. The eyelids were opened by Desmarres' speculum. The mobility of the eyeball was slightly limited in all directions. Slight exophthalmos. Blood and urine were taken for pathological examination.

March 9, 8 *a.m.*—Temperature 39.8°C. 7 p.m., temperature 40.3°C. The pains in the left eye and in the left half of the head disappeared in the morning. The patient stated that his vision was much better than the day before. Exophthalmos and the limited mobility of the eyeball observed in the morning had almost disappeared towards the evening. Swelling, redness and tenderness of the lids of both eyes, greatly diminished in the morning and in the evening almost vanished from the right side. Erysipelas spread over the whole left side of the face, and the right and left sides of the neck. The glands of the neck were appreciably enlarged (erysipelas migrans).

The examination of the upper respiratory passages gave the following results (Dr. Gumpertz, oto-laryngologist):—"In the nose a moderate deviation of the septum to the left. The front part of the two inferior turbinate bones was missing, having been removed operatively from both sides, long ago. In the vestibulum nasi on both sides a slight formation of crusts. A slight atrophy of nasal mucous membrane, so that without making it anaemic one could examine from both sides the middle and upper nasal passages. No hint could be found as to secretion, which could be ascribed to the presence of any inflammation of the neighbouring sinuses. The laryngeal mucosa seemed slightly reddened. There were no signs of any stronger

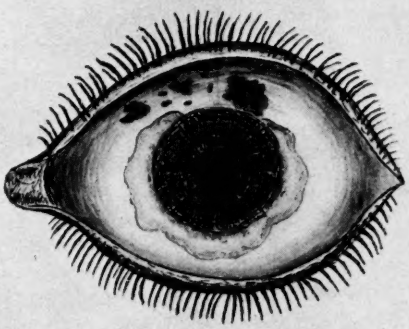
Erysipelas conjunctivae bulbi.

Fig. A



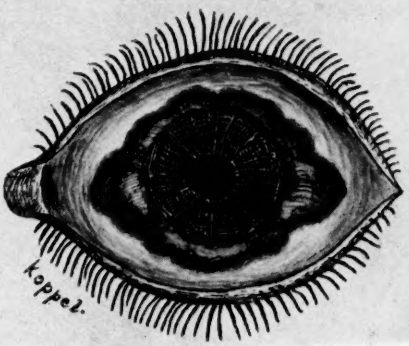
6. a. m.

Fig. B



8. a. m.

Fig. C



6. p. m.

Koppel.

UNIV. OF MICH.

inflammation or oedema. The region of the frontal sinus and the front wall of the antrum sinus were not tender when pressed."

No abnormality whatever found in the heart. The spleen was appreciably enlarged.

From the bacteriological laboratory (Mrs. Dr. E. Shimkin) the following results of the investigations were given :—" Microscopic examination of the fibrinous secretion of the pseudo-membrane from the left conjunctiva of March 6, 7, 8 and 9 continually showed the presence of diplococcus lanceolatus capsulatus Gram-positive, of the type of pneumococcus Thalamon-Fraenkel. In the pseudo-membrane of March 9 together with diplococcus lanceolatus capsulatus were found some specimens of Gram-positive short-chained streptococci."

In the liquid of punctured bullae some specimens of Gram-positive diplococci lanceolati capsulati of the type of pneumococcus Thalamon-Fraenkel were found.

Examination of Urine.—Albumin, 0.25 per cent. An acute positive reaction for urobilogen. The microscopic examination of sediment and all the other reactions were normal.

*Blood Examination.**—Leucocyte, 4,400; polymorphonuclear (neutrophyl) 9 per cent.; lymphocyte, 23 per cent.; monocyte, 68 per cent.; haemoglobin, 65 per cent.; erythrocyte, 3,550,000; index, 0.9.

March 10, 8 *a.m.*—Temperature 38.2°C. The erysipelas of the left eyelids disappeared. The oedema of conjunctiva bulbi was almost invisible. The mobility of the eyeball was completely restored, the exophthalmos disappeared. The patient's vision was equally good in both eyes. The case had passed beyond the care of an ophthalmologist.

Dr. Nissenbaum (an internist, to whom I am obliged for the data of internal examination) took charge of the case. He stated that erysipelas covered completely the neck and a greater part of the chest. Sudden weakness of the heart was observed, and at 12 noon patient collapsed. At 2.25 p.m. patient passed away.

Analysis of the Case

From the history of the illness we see that in the left eye the scleral conjunctiva presented an oedema, haemorrhage and pains, preceding by 30 hours the appearance of erysipelas faciei and palpebrarum of the same side. Temperature and chill started 18 hours after unbearable pains in the left eye and in the left half of the head. The punctate haemorrhages that were observed at 6 a.m. became considerable ecchymoses after two hours. The limited pericorneal oedema of the conjunctiva bulbi occupied 4/5 of the periphery of the cornea after two hours. Ten hours later an abundant ecchymosis was formed on the site previously occupied by oedema. The subjective symptom which brought the patient to the physician was the dull heavy pain in his left eye and the left half of his head, quickly diminishing after the application of 2 per cent. cocaine or 1 per cent. pantocaine, but starting again as soon as the action of the anaesthetic had ceased. The pain in the eye and the head disappeared in proportion to the spread of erysipelas on the eyelids and the face. At the first examination of the patient no disturbances of the skin of the

*N.B.—The leucopenia instead of leucocytosis in case of erysipelas, and monocytosis instead of usual polynucleosis was the result of previous blood diseases of the patient which preceded the erysipelas. Dr. Nissenbaum, internist, who examined the patient two months before his illness had found the same abnormal blood count. This abnormal blood condition was a *signum mali*, which weakened the defensive reaction of the body and hastened the death of the patient.

eyelid or of its margins were observed. There were no signs of inflammation of nasal mucosa nor of any of the upper respiratory passages. During the whole time no pathological signs could be elicited from the lacrymal sac. The bacteriological examinations of fibrinous secretion and of pseudo-membrane of conjunctiva constantly showed the presence of Gram-positive diplococcus lanceolatus of the type of pneumococcus Thalamon-Fraenkel. The same diplococci were found in the liquid of punctured bullae. It must be also stated that the patient had had erysipelas twice previously and that a foreign body had come into his eye 13-14 hours before onset of pain, and that this foreign body had been washed out by the tears.

On the evidence of these symptoms and of the course of the disease, the case was diagnosed as one of primary erysipelas of the conjunctiva sclerae.

How can we explain the appearance of the subjective sensation of unbearable pain in the eye and the head, which seemed to contradict the insignificant findings of the conjunctiva sclerae? The medical history showed that the patient was prone to erysipelas as he had had it before on his hands and face. We also know that trauma was inflicted by a foreign body on the conjunctiva sclerae 13-14 hours before the appearance of pain in the eye and more than 30 hours before the onset of the general signs of erysipelas. It is known that the incubation period of erysipelas from the beginning of the infection till the appearance of the chill and of the temperature can be very short. The shortest period recorded has been seven to eight hours after infection (Kraus-Brugsch, p. 729). The sensation of pain and tension of the skin may precede the general painful phenomena of erysipelas (Struempel, p. 93). If erysipelas of skin and mucous membranes starts always from a sharply delimited and strongly reddened affected part, in this case it started on the scleral conjunctiva in a sharply delimited pericorneal oedema, disposed in the palpebral aperture; these peculiarities are explained by the special construction of the easily mobile tissue of the conjunctiva sclerae. Oedema and ecchymosis of the conjunctiva bulbi is a very common sign in any of the inflammatory processes of the superficial parts of the eye, besides as is known to every physician, oedema is always more clearly marked in the palpebral aperture, in consequence of the absence of the pressure of the eyelids in this region.

The minute trauma of conjunctival epithelium of the sclera by a foreign body opened the way to the infection. The punctate haemorrhages probably corresponded to the abrasions of conjunctiva. The unbearable pain in the left eye and in the left half of the head is a subjective symptom in a case of erysipelas, and it is caused, as has been explained above, by the tension and painfulness

of the affected region of the tissue. The pain was made especially acute by pressing on this region. In this case there was the following vicious circle: the painfulness and tension in the region of the affected conjunctiva evoked a spastic blepharospasm, and this latter gave rise to permanent pressure on the wounded part of the conjunctiva bulbi, causing even greater pain. This pain was transmitted reflexly to the left half of the head along the distribution of I and II branches of the trigeminal nerve, as the terminal ramifications of those branches are the sensory nerves of the conjunctiva of the eye. That is why in applying an anaesthetic to the sensory termination of the trigeminus nerve (a 2 per cent. solution of cocaine hydrochlor., or 1 per cent. solution of pantocaine) the pain in the left eye and in the left half of the head, as well as blepharospasm, disappeared immediately.

The quick onset and disappearance of oedema and of the high tension of different regions of tissue in cases of erysipelas migrans is a usual phenomenon; so it was in this case. When oedema and the tissue tension of the conjunctiva decreased on the third day of the illness, the pain in the eye and in the head simultaneously became less, and on the fourth day disappeared. The disappearance of the oedema was very clearly observed in this case, as was the serous infiltration of the tissues of the anterior part of the orbit. Owing to this serous infiltration there appeared on the third day of the illness limitation of the mobility of the eyeball and a slight exophthalmos, causing apprehension of the beginning of cellulitis of the orbit. All these symptoms disappeared on the fifth day of the illness. By this time the erysipelas had spread over the patient's neck and chest.

Independently from the above considerations, there arises the question whether in this case erysipelas could have been caused by diplococcus lanceolatus of the type of pneumococcus Thalamon-Fraenkel, as usually erysipelas is caused by streptococcus longus pathogenes s. erysipelatus.

Herrenschwand has collected a great deal of literature on the possibility of the passage of the diplococcus lanceolatus under certain conditions of culture into streptococcus haemolyticus and of the reverse process—streptococcus haemolyticus being transformed under certain conditions into viridans and then into typical pneumococcus.

Pfahler found in 66 out of 98 cases of erysipelas that the causative organism was a Gram-positive, non-mobile diplococcus, both intra- and extra-cellular; inoculated into a rabbit's ear it gave rise to a typical erysipelas.

Lehman and Neuman in their last edition of 1927 of "Bakteriologische Diagnostik" state that streptococcus lanceolatus, diplococcus pneumoniae Fraenkel and diplococcus lanceolatus

sive lanceolatus capsulatus are synonyms of the same kind of bacterium, and besides this indicates that the pneumococcus may cause erysipelas (pp. 235-236).

In our case we invariably found diplococcus lanceolatus of the type of pneumococcus Thalamon-Fraenkel in all microscopic examinations of the fibrinous secretion and of the fibrinous pseudo-membrane. And the character itself of fibrinous secretion and of pseudo-membrane correspond to that found in cases of pneumococcal conjunctivitis.

It is supposed that in the patient's conjunctival sac pathogenic pneumococci were present as parasitic organisms. They became virulent during the spring, when pneumococcal conjunctivitis frequently occurs (in Palestine about 2 per cent. of all conjunctivitis is due to pneumococci) (Shimkin).

It is particularly important that the same diplococcus of pneumococcus Thalamon-Fraenkel type was found in the contents of the bullae. The establishment of identity of bacteriological flora in the conjunctival secretion and in the bulla's fluid confirms once again the possibility of erysipelas being caused by pneumococcus of conjunctival origin. In the explanation of the epidemiology of primary erysipelas of the eye and eyelids this observation has a certain importance.

Summary

The author has described a case of primary erysipelas of the conjunctiva bulbi. The first symptoms, that brought the patient to the doctor, were the unbearable pains in the left eye and in the corresponding half of the head. A limited and not very extensive oedema of the conjunctiva in the region of the rima palpebrarum and punctate haemorrhages on the upper periphery of the conjunctiva sclerae quickly increased in size under observation.

The symptoms due to erysipelas of the eye were observed by the author 10 hours before the temperature and the chill started, and 24 hours before the appearance of erysipelas on the face, in consequence of the development *per continuitatem* of the infection from the conjunctiva bulbi on to the skin of the eyelids and on to the rest of the face.

The primary infection of erysipelas conjunctivae sclerae was, in all probability, caused by the pathological diplococcus sive streptococcus lanceolatus of the type of pneumococcus Thalamon-Fraenkel, that penetrated into the lymphatic vessels of the conjunctiva sclerae after its surface had been lacerated by a foreign body.

In examining a patient who complains of unbearable pain in the eye and in the corresponding side of the head, with such insignificant local signs in the conjunctiva bulbi a general practitioner

should, in addition to excluding all the appropriate eye diseases, remember also the possibility of such a rare illness as primary erysipelas of conjunctiva bulbi, especially when the patient gives a history of previous attacks of erysipelas.

REFERENCES

1. **Groenouw, A.**—*Graefe-Saemisch Handb. d. Augenheilk.*, III. Aufl., S. 893, 1920.
2. **v. Herrenschwand, F.**—Die pathogenen Mikroorganismen des Auges, S. 155, 1927.
3. **Krauss, F , Brugsch, Th.**—Spezielle Pathologie und Therapie innerer Krankheiten. II. Band: Infektionskrankheiten. II. Teil., 1919.
4. **Lehman-Neumann** —Bakteriologische Diagnostik. 2 Aufl., II. Band., SS. 235-236, 1927.
5. **Panton and Adams.**—An investigation in the aetiology of the Erysipelas allied infection. *Lancet*, Vol. II, p. 1065, 1909.
6. **Pfahler.**—The Bacteriology of Erysipelas. *Philad. Med. Jl.*, April 19, 1902.
7. **Struempel, Ad.**—Lehrbuch der speziellen Pathologie und Therapie der inneren Krankheiten. Bd. I., XXII. Aufl., 1920.
8. **Shimkin, N.**—Pantocain, a new anaesthetic in eye practice. Folia ophthalmologica orientalia. Fasc. 2, p. 195, 1933.
   —— Blindness among Jews in Palestine and its causes. Congrès International de Médecine tropical et d'Hygiène. Le Caire, Egypt, Décembre, 1928. *Compte Rendu*, Vol. III, p. 837, 1931. Le Caire.
9. **Terrien, F., and G. Coussin.**—Affection de l'oeil en médecin général. 1924.

THE X-RAY TREATMENT OF BLEPHARITIS*

BY

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Pathology

Two main varieties of blepharitis are known, *viz.*—

1. *Blepharitis squamosa.*—Here the lid margin is reddened, the palpebral conjunctiva is hyperaemic and the space between the cilia is filled with small thin whitish scales resembling dandruff. The scales can be removed imperfectly by washing or more thoroughly by forceps, leaving the lid margin reddened and succulent, but not ulcerated. The cilia fall out easily. They soon grow again.

Instead of the scaly formation mentioned, the lid margin may present yellow crusts with no underlying ulceration, due to the drying of the excessive sebaceous secretion.

* Read before the Egyptian Medical Association and the Ophthalmological Society of Egypt at its Annual General Meeting in March, 1934.

Burning and itching prevail. Generally there is also present a chronic type of catarrhal conjunctivitis.

2. *Blepharitis ulcerosa,* or the eczematous type of blepharitis.—This is a more severe process. The lashes are matted together with yellow crusts, and on their removal a raw bleeding surface remains. From the centre of each yellow elevation a cilium arises. The lid presents numerous abscesses from suppuration in the hair follicles and their sebaceous glands. It shows an irregular worm-eaten condition from the cicatrices of healed abscesses and the extension of those yet existing. Where the cicatrices exist, the cilia are absent because of destruction of their follicles.

Blepharitis ulcerosa, accordingly, is distinguished from blepharitis squamosa by its deeper situation and the purulent character of its inflammation.

Treatment

Stumpf and Eichenlaub, using a dose of 50 per cent. unfiltered rays at intervals of two weeks, got results in some cases. Comberg saw some cases treated by 10 per cent. and 20 per cent. X-rays with no improvement. Fried and Haidenhein recorded good results in a great number of cases. Other workers recorded similar results, but permanent cures were not recorded by anybody.

Since the X-rays are the most suitable agent in treating conditions of a similar pathological nature, *e.g.,* furunculosis, sycosis vulgaris, favus, ringworm of the scalp, and all other conditions in which the hair follicles are affected, it seems quite feasible to try to perfect a technique by which blepharitis can be treated and cured. I have found that the essence of success in the treatment of these conditions was in the thorough epilation of the cilia by the action of the rays. Cases in which the treatment failed to cause complete epilation, though showing marked improvement during the course of treatment, have invariably recurred. I have also found that better results were obtained when the epilation dose was given fractionally than when given all at once.

To evert the lids, and at the same time to make the X-rays safely applicable to the eyes, I have devised a special forceps (Fig. 1).* It consists of a forceps with long handles and slightly bent terminals. The length of the handles allows the forceps to be supported at the side of the head, thus taking its weight off the eye itself. To the terminals are attached upper and lower eye shields. These are made of 3 mms. of zinc and 2 mms. of lead. The addition of the latter cuts off practically all secondary irradiation. These shields are removable, and are made in a series of different sizes (Fig. 2).* With these adjustable shields the same

* Made by Siemens, Reinger.

forceps can be used for both eyes. When the forceps is in position, all the globe, with the exception of the fissure between the lids, is protected. This latter part is protected by a lead glass prosthesis (Fig. 4).*

Technique.—The eye is made insensitive by the application of cocaine drops; the prosthesis is applied and one lid is held between

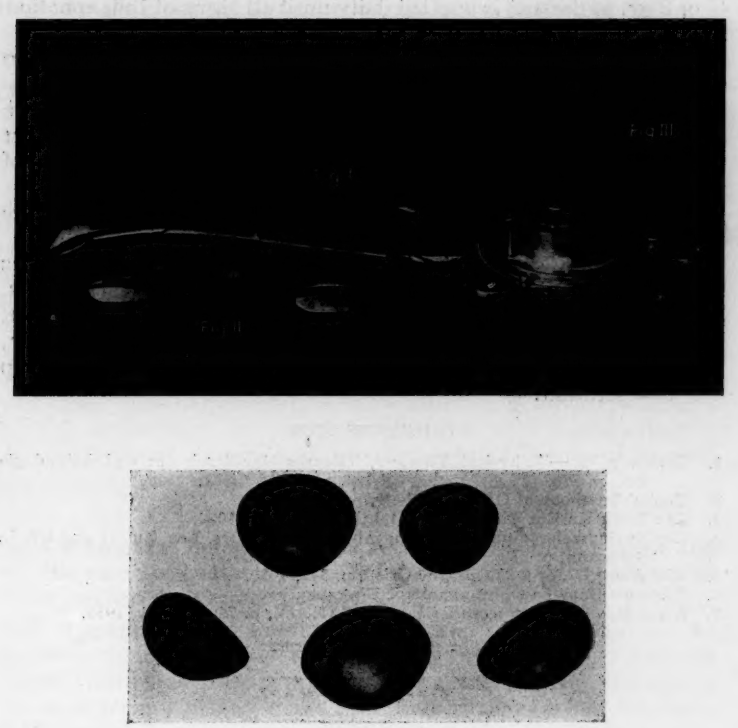

FIG. 4.

the limbs of the forceps; its margins, together with the cilia, are made to face upwards; the rays are applied through a circular diaphragm of lead glass of 5 cms. diameter (Fig. 3).†

After each sitting some of the cocaine drops are applied.

* Made by Siemens, Reinger.

† The treatment formula is as follows:—K.V. 120, Filter 1 mm., Aluminium M.A.3, S.F.D. 30 cms. The epilation dose with this formula took 7 minutes. One third of this dose is given every third day.

Subsequent events.—Slight congestion of the lids occurs after each sitting and lasts for a few hours. Improvement begins to take place one week after the last sitting; the scabs dry up, the congestion becomes less apparent, and the irritation diminishes.

The epilation begins about the end of the second week, and is complete by the 21st day. When this happens, ung. hydrarg. ammoniatum 2 per cent., or yellow oxide of mercury ointment (1 or 2 gr. to the oz.) is applied daily until all signs of inflammation have completely disappeared.

In all the cases treated, the eye lashes grew again about two months after the epilation.

Relapses.—In the 20 cases treated by me so far, two have relapsed, and I attribute this to incomplete epilation. The treatment was given again to these cases one month after the regrowth of the cilia, and both were cured.

The cases treated were of both the squamous and ulcerative types.

Attention to general health was given, and other affections present, *i.e.*, conjunctivitis, entropion, ectropion, lacrymal stenosis, and nasal-pharyngeal diseases, were given appropriate treatment.

I have to thank Dr. M. A. H. Attiah, Dr. A. F. El-Togby, Dr. Aziz Barrada, and Dr. H. Abu-Saif for their valuable help and co-operation.

REFERENCES

1. Comberg, W.—"Physical Therapy," Kurzes Handbuch der Ophthalmologie Bd., p. 770.
2. Fuchs' Textbook of Ophthalmology, p. 666.
3. The American Encyclopaedia of Ophthalmology, p. 1022.
4. Die Radiumbehandlung in der Augenheilkunde, by Dr. Leo Kumer and Dr. L. Sallmann, p. 27.
5. *The Amer. Jl. of Ophthal.*, by Crisp, p. 342, 1930.
6. Franke's Book on Ophthalmologic Therapeutics.
7. *Klin. Monatsbl. f. Augenheilk.*, Vol. LXXXIV, p. 76, January, 1930.

ABSTRACTS

I.—CORNEA

(1) **Zitting, Erna (Helsingfors). — The corneal sensitivity in trachoma. (Untersuchungen ueber die Hornhautsensibilität bei Trachom).** *Klin. Monatsbl. f. Augenheilk.*, Vol, LXXXIX, p. 301, 1932.

(1) By employing standardized hair of different thicknesses and a scheme whereby the cornea was mapped out into nine regions, Zitting investigated variations in the sensitiveness of the

corneae in 42 cases of trachoma; 73 corneae had pannus, and of these cases all but two had diminished sensitivity of varying degree. Decrease in sensation seemed to be in direct proportion to the degree of the pannus, and also to the duration of the affection. Corneae unaffected by pannus, as also corneae in healed trachoma, showed diminished sensation. That diminished corneal sensation precedes the development the author could not confirm; cases of unilateral trachoma gave normal corneal reactions in the unaffected eye.

ARNOLD SORSBY.

(2) **Schmidt, R. (Celle).—On superficial striate keratitis of herpetic origin. (Ueber die streifenformige Keratitis superficialis herpetica).** *Klin. Monatsbl. f. Augenheilk.*, Vol. XCII, p. 47, 1933.

(2) Recalling the work of Caspar (1903), Spicer and Greeves (1916) and Haab (1916) on superficial striate keratitis, **Schmidt** reports that during an epidemic of herpetic eye lesions, four cases of striate keratitis were seen. The striae seemed to be made of fine dots and did not involve the interstitial tissue. Occasionally they were stained by fluorescein. Pain was a marked feature and corneal sensitiveness was diminished. Transient changes simulating superficial punctate keratitis were observed in three of the four cases. The herpetic origin of the affection is further evidenced by the appearance in one case of iritis with haemorrhages, characteristic of herpes and by the positive result of corneal scrapings applied to the eye of a rabbit.

ARNOLD SORSBY.

(3) **Caramazza (Bologna).—The aetiology of conical cornea, and the value of contact lenses. (Sulla etiologia del cheratocono e sull'uso dei vetri di contatto).** *Boll. d'Ocul.*, May, 1934.

(3) **Caramazza** has examined 15 cases of conical cornea; he discusses their endocrinal reactions and concludes that it is not possible with our present knowledge to attribute the disease to the derangement of any gland; the immediate cause is weakness of the centre of the cornea, but to what this deficiency is due, cannot at present be ascertained; he has found contact lenses very useful both in improving the visual acuity and tending to prevent further yielding of the cornea.

HAROLD GRIMSDALE.

(4) **Reigel, E. (Bonn).—Familial corneal dystrophy. (Ueber familiäre Hornhautentartung).** *Klin. Monatsbl. f. Augenheilk.*, Vol. XC, p. 498, 1933.

(4) **Reigel** reports corneal lesions in five members of a family over three generations. The lesion, which was inherited in a

dominant manner, consists of fine punctate opacities, situate centrally just beneath the epithelium. That the lesion is congenital is suggested by the fact that it was seen once at 1 year six months and differed but little from the appearances seen in three older members of the family (aged 13, 33 and 35 years), though there was some departure from the appearance observed in the oldest patient (69 years).

ARNOLD SORSBY.

(5) **Groenouw (Breslau).—Nodular corneal opacity transmitted through four generations. (Knötchenförmige Hornhauttrübungen vererbt durch vier Generationen).** *Klin. Monatsbl. f. Augenheilk.*, Vol. XC, p. 577, 1933.

(5) **Groenouw** extends a family tree first described by him in 1917 (*ibid.* Vol. LVIII, p. 411). Of 48 persons in four generations, eight were affected. The originator of the family was married twice; of the three offspring of the first marriage two were affected, and one out of five of the second marriage. There are two affected individuals in both the third and fourth generations. The mode of inheritance is dominant. With the exception of the originator of the family, all affected individuals were female.

ARNOLD SORSBY.

(6) **Schappert-Kimmijser, Johanna. (Amsterdam).—Recurrent corneal erosion and familial corneal dystrophy. (Rezidivierende Hornhauterosion und familiäre Hornhautentartung).** *Klin. Monatsbl. f. Augenheilk.*, Vol. XC, p. 655, 1933.

(6) **Schappert-Kimmijser** gives a tree extending over four generations with nodular dystrophy of the cornea. The author draws attention to the association of erosion with dystrophy as reported in the literature and stresses the fact that the erosions may preceed the dystrophy, though in some members of the family this was not the case. The case of a child who had six spontaneous erosions in the second and third year of life, whose mother is suffering from nodular dystrophy, is discussed. Presumably the child will develop corneal dystrophy.

ARNOLD SORSBY.

(7) **Bietti. (Naples).—The pathology of patchy degeneration of the cornea. (Sull'anotomia patologica della degenerazione corneale a tipo screziato—Fehr).** *Rass. Ital. di Ottal.*, March-April, 1934.

(7) Corneal degeneration is found in many forms, the commonest being the familial nodular form. Other varieties are less common and frequently single cases have been described as

separate forms. **Bietti** has watched a case and was able to secure a fragment of the cornea for microscopical examination. He finds that in most essentials the findings are similar to those of the nodular form and concludes that the "patchy" is a mere variety of the nodular. In the region of the degeneration there are found two substances, one acidophil and the other basophil; the last seems to have some relation to mucin.

HAROLD GRIMSDALE.

(8) **Russo. (Bari).—Argyrosis of the cornea. (Argurosi della cornea).** *Ann. di Ottal.*, May, 1934.

(8) **Russo** publishes the notes of three cases of argyrosis of the cornea following the continued application of some silver preparation to the conjunctiva. Most of the cases which have been recorded previously have come from workers in silver. In these it must be supposed that the silver is brought to the cornea through the blood and lymph vessels; this can hardly be the case in the subjects of the present note; the silver must have penetrated directly into the tissues combining with the substance of the cornea. Descemets' membrane seems to be the seat of election for the deposition of the silver, but in one case the author has seen fine granules also in Bowman's membrane.

HAROLD GRIMSDALE.

II.—CONJUNCTIVA

(1) **Rollin (Paris).—The circulation of the bulbar conjunctiva. (La circulation de la conjonctive bulbaire).** *Thèse pour le Doctorat en Médecine*, Paris, 1933. Legrand, Boul. Saint-Germain, Paris.

(1) *Arteries of the bulbar conjunctiva.*—The bulbar conjunctiva is nourished by two vascular networks, one a superficial or conjunctival which arises from the posterior conjunctival arteries and supplies the whole of the conjunctiva except the circum-corneal zone, and the other a deeper or ciliary network, which is sub-conjunctival or episcleral, and arises from the anterior ciliary vessels; this latter supplies the circum-corneal zone. These two networks, although anastomosing at their peripheries, are quite distinct.

These two origins of vascular supply explain the difference between conjunctival and ciliary injection in pathological conditions. The general conjunctiva becomes injected when the palpebral conjunctiva is inflamed, while the circum-corneal zone

exhibits its definite rosy appearance in inflammatory affections of the uveal tract.

While the superficial network is usually lost in the conjunctival tissue before it reaches the limbus, on occasion it may communicate with limbal vessels.

The deeper network arising from the anterior ciliary arteries advances concentrically towards the cornea, but at two millimetres from the limbus the vessels bury themselves in the sclerotic, anastomosing with the vascular supply of the iris at a deeper level.

At the point where they bury themselves the anterior ciliary arteries (of Testut) are given off. These passing along the deep surface of the bulbar conjunctiva divide and anastomose between themselves, forming arcades parallel to the corneal margin. From these arcades two kinds of very fine branches are given off, one of which, 7μ or 8μ in size proceed towards the limbus, while the other kind pursuing a recurrent course anastomose with the terminations of the posterior conjunctival arteries at 3 or 4 millimetres from the border of the cornea, after having provided extremely fine capillaries for subconjunctival network around the cornea (Terrien).

The tiny corneal branches are given off at the same level as the recurrent branches mentioned above. They have a superficial course and rejoin the pericorneal vascular network.

These vessels form arcades with the convexity turned towards the centre of the cornea and anastomoses between arteries and veins occur by inosculation as Terrien called it. They are the vestigial remains of the precorneal vascular network of the foetus.

Veins of the bulbar conjunctiva.—As in the case of the arteries a conjunctival venous plexus and a ciliary venous plexus can be distinguished.

The conjunctival plexus is formed from the posterior veins and appears throughout the extent of the conjunctiva which is irrigated by arteries of the same name. The veins anastomose between themselves and also with the ciliary plexus.

All these veins empty into the retrotarsal plexus, except for a few anastomoses with derivatives of the facial and superficial temporal veins.

The ciliary plexus is formed for the most part by venules coming from the limbal arcades and emptying into the veins about the recti muscles. The origin of the blood they contain is intraocular, the vessels emanating from the ciliary body; they traverse the sclerotic usually to the number of four, after which each vein usually divides into two channels, one of which joins the veins about the recti, and the other helps to form the perilimbic venous plexus. The clinical importance of this deep conjunctival venous plexus, situated on the surface of the sclerotic, is very great.

Lymphatics of the bulbar conjunctiva.—All round the cornea is a rich and delicate network, a millimetre broad, forming the circulus lymphaticus; this is closed towards the cornea on the distal side, but on the proximal side gives origin to radial vessels which at a distance of 4 or 5 mm. from the corneal margin form another plexus and then proceed to the palpebral conjunctival lymphatic trunks, and thence, beneath the fibres of the orbicularis muscle, to the parotid glands.

Biomicroscopy of the conjunctival circulation.—The deep conjunctival plexus is seen to be extremely rich. In some of the vessels the blood column is uninterrupted and apparently immobile, while in others, but more rarely, an extremely rapid wave is seen, while in yet others the blood stream is fragmented.

One cannot distinguish arteries from veins by the direction of the current. However, the veins are generally three or four times as wide as the arteries, and are darker in colour.

If an artery is followed as it becomes smaller and smaller it is seen to take the shape of a loop, more or less complete. At the extremity of the loop the vessel is seen to become larger suddenly and its contents to become fragmented. From here the artery changes into a vein. In the artery a rapid wave can be detected, with difficulty, which ceases on the appearance of venous fragmentation. The appearance of fragmentation is due to the sudden enlargement of the vessel's calibre.

As is well known, there are usually two vascular arcades at the corneal periphery extending for several millimetres into the cornea. To bring them into view the upper lid may be massaged on the globe. They are not ordinary loops, an afferent arteriole with an efferent venule. These arcades receive much more venous than arterial blood. The arterioles are generally situated more superficially than the veins.

The lymphatics are very difficult to distinguish under ordinary conditions. They may occasionally be made out within an area of between 3 and 10 mm. on the proximal side of the limbus as tiny white crenellated channels which frequently anastomose. At the level of the limbus they seem to anastomose in arcades or to terminate. From the arcades or terminations extremely fine prolongations plunge into the corneal tissue. The lymphatic vessels are often accompanied by a very fine venous capillary.

Besides these, perivascular lymphatic sheaths can be detected. It appears that the lymphatics of the cornea commence in lacunae between cells. Whether here is an open end of the lymphatic vessel or whether it ends in a rounded closed end is immaterial, since there would be no difficulty in the passage of fluids and cells through the extremely delicate wall of the capillary.

Physiology of the conjunctival circulation.—A study of the

globular movement within the conjunctival vessels allows us to see how irregular this circulation is. We see plexuses which are in full activity suspend for a time their circulation, while inactive vessels re-open again and show an active circulation. This irregularity manifests itself in the current itself, sometimes the globules proceed at a great pace, at others they proceed in a faltering manner in the direction of their current. One may see the contents of a vessel, sometimes fragmented, sometimes more homogeneous, come to a full stop, then falter, and then proceed in the opposite direction.

One of the differences between arterioles and venules is the appearance in the former of a wave or undulation, which is quite independent of the ventricular systole. It has a rhythm of about 130 to 140 undulations a minute. It is a vermicular or peristaltic movement. It is very irregular; after a series of undulations the vessel may remain absolutely immobile for quite a long time, perhaps in a contracted condition, and then suddenly dilate and continue its undulations.

It is, therefore, clear that the capillaries take an active part in the progression of the blood, their automatism at the periphery of the vascular apparatus explaining the acceleration or slowing of the local circulations.

The slowing of the circulation at the level of the limbus may be considered as favourable for nutritive exchange so important for the vitality of the eye, and certainly for the transparency of the cornea.

In much of his interesting work the author follows in the footsteps of his inspirer at the Quinze-Vingts Hospital, Bailliart (see *Bull. Soc. Franç. d'Ophtal.*, 1925, p. 325).

In view of the powers of absorption of the conjunctiva it is possible that it may be a portal of entry for various infections. It has been suggested by Philibert that the virus of mumps obtains entrance in this manner, and it may be that encephalitis and influenza attack likewise.

Rollin also describes his experiments on the action of various collyria on the conjunctival circulation, and considers various pathological conditions as well.

A. F. MACCALLAN.

(2) **Gabardi (Bologna).—Biomicroscopic observations on the limbal lesions in spring catarrh. (Osservazioni biomicroscopiche sulle lesioni limbali nel cattarre primaverile).** *Rass. Ital. di Ottal.*, December, 1933.

(2) **Gabardi** describes the changes he has observed in 10 cases of spring catarrh. He has always found irregular new capillaries in the conjunctiva and the marginal rete of the cornea. Further,

he finds small bullous cysts in the thickness of the conjunctiva, and a slight turbidity of the marginal cornea from dust-like opacities.

HAROLD GRIMSDALE.

(3) **Olitsky (New York).—Spontaneous conjunctival folliculosis of monkeys.** *Bull. Ophthal. Soc. of Egypt*, 1933.

(3) It has been suggested that spontaneous conjunctival folliculosis of monkeys has two forms (Wilson, *Giza Mem. Ophth. Lab. Report*, 1928). Type I a simple follicular conjunctivitis, and Type II in which similar lesions are progressive and accompanied by inflammatory reactions.

Olitsky claims to have discovered a specific organism for Type II.

A. F. MACCALLAN.

(4) **El-Bakly and Abbassi (Cairo).—The diagnostic value of Tricoire's reaction in trachoma.** *Bull. Ophthal. Soc. of Egypt*, 1933.

(4) In 1923 Tricoire described a method for the diagnosis of trachoma (*Bull. de la Soc. de Pathol. Prat.*). It is as follows:—The result of the expression of trachoma follicles is diluted with 10 times its volume of physiological salt solution. This is incubated at 37°C. for two weeks. It is then centrifuged and again diluted with an equal volume of salt solution. To 10 c.c. of this is added two drops of tincture of iodine; 0·25 c.c. of this is injected intradermally. According to Tricoire a red papule, which is not painful, appears at the site of inoculation after 48 hours, and persists for two or three days. In negative cases no such reaction is obtained.

El-Bakly and Abbassi employed this test in a number of trachomatous and non-trachomatous cases and concluded that it had little or no diagnostic value. The authors of this paper have a wide experience of pathological and clinical investigation.

A. F. MACCALLAN.

(5) **Togby and Wilson (Cairo).—A contribution to the study of xerophthalmia.** *Bull. Ophthal. Soc. of Egypt*, 1933.

(5) Xerotic patches have been observed in Egypt since early times. They were first described by Bitot of Bordeaux in 1863.

Togby and Wilson quote MacCallan's description of them as follows:—"They are triangular patches on the conjunctiva or cornea which are covered with a white substance like foam or beaten up white of egg. This is easily removed, but is reproduced in about a day."

These patches consist of epithelial proliferations and there is an increase in the number of leucocytes in the subconjunctival tissue. The superficial layers of the epithelium show well marked keratinization. No fat granules can be demonstrated. Beneath the keratinized layer there is a well marked layer of cells showing granules of kerato-hyalin. These are principally situated in the periphery of the cells. The innermost layers show cells with intercellular bridges. No goblet cells are present.

Xerosis bacilli are found, but are not the cause of the condition. Hemeralopia is only occasionally associated with the condition. Intestinal parasites such as the ankylostoma duodenale and bilharzia haematobium are usually associated with xerosis and probably are the cause of avitaminosis, which may be the determining factor.

A. F. MACCALLAN.

(6) Sbordone (Roma).—A new method of prophylaxis against ophthalmia neonatorum. (Un nuovo metodo profilattico per l'oftalmoblenorrea dei neonati). *Boll. d'Ocul.*, April, 1934.

(6) Credé's method in inexperienced hands may lead to mischief. **Sbordone** thinks that hydrogen peroxide will prove an efficient substitute, if used in copious lavage.

HAROLD GRIMSDALE.

(7) Canitano (Naples).—Sterilisation of the conjunctiva. (La sterillizzazione dell'occhio in rapporte agli agenti della suppurazione). *Lett. Oftal.*, April, 1934.

(7) The normal conjunctiva is not sterile; many bacteria live there as saprophytes, especially the staphylococci; streptococci and pneumococci are also frequent inhabitants of the sac. If the tissues become less resistant by lowered nutrition or by injury, these germs may become dangerous. It is, therefore, advisable to discourage their development in all ways and if possible to secure their absence before any operation is undertaken. **Canitano** has found the best means to secure this end, is the use of filtrates of bacterial cultures in a suitable medium. This applied to the eye helps to bring about local immunity. The preparation which the author prefers is named Ophthalmolimas.

HAROLD GRIMSDALE.

III.—GENERAL MEDICINE

(1) **Adie, W. J. (London).—Some common ocular symptoms.** *The Practitioner*, May, 1934.

(1) Few of the signs and symptoms encountered in daily work are free from ambiguity. This is especially the case with regard to certain changes in the pupillary reactions which were first described by that distinguished ophthalmic surgeon, Argyll Robertson, as peculiar to syphilis. The full syndrome which he described is often wrongly abbreviated and yet called by his name. In order to avoid error, it is, therefore, preferable to speak of "pupils peculiar to syphilis," and not of "Argyll Robertson pupils."

The pupils peculiar to syphilis have the following characteristics: (1) The signs are present in both eyes; (2) the pupils are small; (3) the light reflex, direct and consensual, is absent; the pupils do not contract with increased illumination nor dilate when they are shaded; (4) the contraction of the pupils on convergence-accommodation is prompt and complete; when the act of convergence ceases, the pupils regain their resting size *at once;* (5) the response to mydriatics is slow and incomplete; (6) useful vision is present. If all these criteria are satisfied the patient under examination is a syphilitic.

The tonic pupil is seen most often in females; it is usually unilateral and larger than its fellow. It does not react to light, but reacts on convergence in a peculiar way; at first there may be no response, but after a few seconds it contracts very slowly to a size often much smaller than the other, normal, pupil. If the patient then looks into the distance it remains small for a varying time and then dilates very slowly, taking perhaps several minutes to reach its usual resting place. During this time the patient is surprised to find that the pupil which is usually the larger one is now the smaller. It should be well known, therefore, that a harmless, not uncommon, disorder exists, characterized by pupils that "react on accommodation but not to light," and absent tendon reflexes.

Inequality of the pupils or anisocoria is so often seen in healthy persons that we may be tempted to treat it lightly. However, it is frequently associated with thoracic and abdominal disease as the result of interference with the sympathetic system.

Nystagmus of slight intensity appearing only on extreme lateral deviation of the eyes is very often physiological, and if the patient is free from signs and symptoms otherwise it may be ignored. Nystagmus is so well known as one of the classical signs of disseminated sclerosis that undue weight is often attached, both to its presence and its absence. It is well to remember that it is

absent, more often than not, in the early stages of the disease, that it has been observed in many unrelated diseases of the brain and spinal cord, that it is rarely of value for differential diagnosis, and that it is not uncommon with tumour of the spinal cord, a curable condition which may thus come to be mistaken for disseminated sclerosis, a hopeless disease.

As regards *ocular palsies* the author gives useful information and remarks that isolated paralysis of one-sixth nerve is very common and its causes numerous. In a majority of the cases no cause is found and recovery occurs.

A. F. MACCALLAN.

(2) **Machener, H. (Münster).—Contribution to the physiology and pathology of the pupil. (Beiträge zur Physiologie und Pathologie der Pupille).** *Klin. Monatsbl. f. Augenheilk.*, Vol. XCI, p. 302, 1933.

(2) **Machener** reviews the literature on the optical apparatus employed in the measurement of the pupil and describes an instrument of his own based on cinema-photographic principles. The apparatus allows the taking of sharp pictures of one or both pupils at the rate of 8 to 90 per second. Magnification for more detailed study is possible. The limit of error for the instrument is given as 0·015 mm. and 0·01 second. The instrument is of value in the analysis of iris movement under physiological conditions, of the direct and consensual reactions in the illuminated and non-illuminated phases, the convergence reaction, pupillary unrest and in the study of summation of effects.

ARNOLD SORSBY.

(3) **Jaensch, P. A. (Breslau).—Clinical contribution to the question of the presence of distinct pupillomotor fibres in the optic nerve. (Klinische Beiträge zur Frage des Vorkommens gesondeter pupillomotorischer Fasern im Sehnerven).** *Zeitschr. f. Augenheilk.*, Vol. LXXXI, p. 35, 1933.

(3) **Jaensch** describes 12 cases seen during the last 10 years in Bielschowsky's clinic bearing on the question whether pupillomotor fibres are distinct from sensory fibres in the optic nerve. In four cases there was rigidity of the pupils in spite of good central vision; reaction to light was maintained in three cases in spite of blindness due to injury of optic nerve, and in five cases of blindness due to tumour or organic disease. The author concludes in favour of distinct sets of fibres, but leaves open the question as to whether the motor fibres are modified sensory fibres (Behr) or of a totally different structure. He also holds that the pupillo-motor fibres are more resistant than the sensory fibres.

ARNOLD SORSBY.

(4) **Aliquo-Mazzei (Sienna).—Unilateral Argyll Robertson pupil after injury. (Segno di Argyll Robertson unilaterale consecutivo a traumatismo cranico).** *Lett. Oftal.*, May, 1934.

(4) One-sided Argyll Robertson pupil has been recorded on several occasions after wounds during the Great War. Its pathogenesis is not well understood and this is scarcely to be wondered at since the paths of the normal reflex are not yet known with certainty. After enumerating the various theories on this point, **Aliquo-Mazzei** sums up what is generally accepted, as follows:—The pupillary fibres take origin in the bipolar cells of the retina and thence pass in the optic nerve to the chiasma (where they have partial decussation), the optic tract forming according to some a special bundle in the upper inner region. They thus reach the external geniculate body and the anterior corpus quadrigeminum where they become connected to the lateral ganglion cells. The efferent fibres beginning here pass downwards to come into relation with the Edinger-Westphal nucleus or some part of the third nucleus and after partial decussation unite with the fibres coming from the oculo-motor nucleus, but have no connection with the nuclei of these. Thence they pass into the branch for the inferior oblique and thence to the ciliary ganglion in which they come into relation with the cells thereof.

It is not clear where the lesions are situated which have given rise to this phenomenon in the cases alluded to. The author records a case in which a fracture of the parietal bone was accompanied by paralysis of the facial, and by an Argyll Robertson pupil of the opposite side. Having excluded all diseases capable of giving rise to this symptom, he concludes that it is due to injury by *contre-coup* of the facial and of the pupillo-motor fibres in the trunk of the third nerve.

HAROLD GRIMSDALE.

(5) **vom Hofe, K. (Cologne).—The frequency of eye changes, especially of pupillary disturbances after syphilitic infection. (Die Häufigkeit von Augensymptomen, unbesondere Störungen der Pupillenreaktionen nach syphilitischer infektion).** *Zeitschr. f. Augenheilk.*, Vol. LXXIX, p. 511, 1933.

(5) **vom Hofe** investigated 200 cases attending a V.D. centre. The infection dated from 5 to 37 years. Twenty-five per cent. of the cases had pupil disturbances, 3 per cent. changes at the disc, and 1·5 per cent. palsies of the extra-ocular muscles. Whether treatment had been obtained or not, did not seem to affect the frequency in the onset of ocular complications.

ARNOLD SORSBY.

(6) **Fleischer, B. (Erlanger).—Fever treatment in tabetic optic atrophy. (Zur Fieberbehandlung der tabeschen Sehnervenatrophie).**

Busacca, A. (St. Paulo).—Sulphur therapy in syphilitic optic atrophy and other eye diseases (Schwefeltherapie bei luetischer Atrophia n.o. und anderen Augenkrankheiten).

Springovitch, Gertrud (Riga).—Retrobulbar atropine injection in the treatment of optic atrophy. (Ueber die Ergebnisse der behandlung von Sehnervenatrophie mit retrobulbären Atropininjektionen).

Klin. Monatsbl. f. Augenheilk., Vol. XC., pp. 335, 352, 343, 1933.

(6) **Fleischer** notes the discrepant reports on the material treatment of optic atrophy and records eight cases of his own. In none was the treatment deleterious, and the results may be regarded as satisfactory if the criterion of arrest of the disease or slowing down of its course, is utilized. In two cases observed for 7 to 8 years useful vision was maintained. On two cases treated with sulfosin it is too early to express an opinion.

Busacca recalls the earlier work of Winkler (*Jl. of Nerv. Tment. Dis.*, 1931, Vol. LXXIII, p. 276) in the treatment of tabetic optic atrophy by sulphur, and records four cases of his own. Treatment consists of 10 intra-muscular injections of sulphur at intervals of a week combined with injections of bismuth twice weekly. The dose at first is 0·5 mgm., rising to 2 mgm. There should be no fever with the first three injections. In the four cases reported by the author, hyperaemia of the fundus could be seen on the day of the injection, disappearing after a few days. Transient deterioration of vision occurs during the treatment. Whilst not expressing a definite opinion owing to the short time the cases have been under observation, the author notes good results in several cases of choroido-retinitis.

Springovitch reports on the results of retrobulbar injections of atropine in 51 cases of optic atrophy of various origin. The injections (0·5 c.c. of 1 in 1,000 solution) were made once or twice weekly. Good results were noted in recovery of acuity and field. In five cases the period of observation was over six months. Improvement sets in with the first injection.

ARNOLD SORSBY.

(7) **Klar, J. (Kattowitz). — Encephalomyelitis optica acuta.** *Klin. Monatsbl. f. Augenheilk.*, Vol. LXXXIX, p. 645, 1932.

(7) **Klar** reports four cases of rather similar clinical course and suggestive of a special type of disseminate encephalo-myelitis. Ophthalmoscopically a picture suggestive of papilloedema was

present, but the evidence of the cerebro-spinal fluid was in favour of papillitis. Central scotoma, field defects of varying intensity, and even blindness lasting for two weeks were observed. Recovery, with some damage and temporal pallor, was the rule. The author discusses the differential diagnosis for disseminated sclerosis and the identity with abortive encephalo-myelitis.

ARNOLD SORSBY.

(8) **Hamburg, J. (Cluj-Klausenburg).—The favourable effect of increased cell oxidation in tabetic optic atrophy. (Ueber günstage Beeinflussung der tabischen Sehnervenatrophie durch Steigerung der Zelloxydation).** *Zeitschr. f. Augenheilk.*, Vol. LXXIX, p. 331, 1933.

(8) Hamburg draws an analogy between the optic atrophy of tabes and alcohol poisoning and argues that oxidation is reduced as a result of diminished catalysis of the heavy metals. On this basis he administered manganese in the form of potassium permanganate 1 per cent. solution as also thyrotoxin. He reports improvement in five out of seven cases thus treated, and gratifying results in four out of the five.

ARNOLD SORSBY.

(9) **ter Braak, J. W. G. and van Herwaarden, A. (Amsterdam). —Ophthalmo-encephalo myelitis.** *Klin. Monatsbl. f. Augenheilk.*, Vol. XLI, p. 316, 1934.

(9) In a well documented article ter Braak and van Herwaarden attempt to build up a clinical entity consisting of neurological and ocular signs. The neurological features are mainly of the pyramidal tract type, associated sometimes with lesions of two cranial nerves. Ophthalmoscopically there are perivascular changes ranging from those of a mild degree to severe retinal and even choroidal lesions. Arguing from the six cases reported, the authors hold that the pathology is similar to that of disseminated sclerosis, the hypothetical virus, gives inflammatory reactions which are clinically silent; but that in the eye the secondary breaking up of myelin proliferation of glial tissue leads to functional, and ophthalmoscopically visible, changes.

ARNOLD SORSBY.

(10) **Spadavecchia (Bari).—The ocular symptoms of epidemic encephalitis. (Encefalite epidemica e manifestazioni oculari).** *Ann. di Ottal.*, May and June, 1934.

(10) Though cases of this disease had no doubt been recorded in the past, its recognition as a separate entity dates back only to 1917, when it gave rise to a considerable epidemic in Vienna.

In the acute stage, some ocular disturbance is among the most frequent signs; the others being pyrexia and somnolence—from which arises its common name of "sleepy sickness." **Spadavecchia** describes fully, eight cases, and discusses the ocular findings. In the acute stage there is often isolated paralysis of one or more muscles; when the acute stage has passed, this usually disappears and is followed by spasm of a group of muscles, for example, the two external recti, so that the convergence may appear deficient. In four of his eight cases there was some degree of atrophy of the optic nerve. He thinks that the seat of the disease lies in the small vessels, which are seen post-mortem to be surrounded by exudate in nodules. The vessel walls become more permeable to the toxin and thence arise functional disturbances.

The paper should be read in full.

HAROLD GRIMSDALE.

(11) **Vos, Tj. A. (Groningen).—Myotonic dystrophy with cataract. (Ueber myotonische Dystrophie mit Kataract).** *Klin. Monatsbl. f. Augenheilk.*, Vol. XCI, p. 187, 1933.

(11) **Vos** reports a typical case of myotonic dystrophy in which cataract developed rapidly and was first seen at an advanced stage. This is the second case reported in Holland and a careful study of the family history was made. A tree extending over four generations is given. Cataract was common in the family and the process of anticipation is illustrated by the family tree, which also brings out the presence of unaffected collateral branches.

ARNOLD SORSBY.

(12) **Vogt, A. (Zürich).—Dyscephaly (Dysostosis craniofacialis, Maladie de Crouzon, 1912) with an hitherto unobserved combination with syndactyly of the four extremities (Dyscephalodactyly). (Dykephabe (...) und eine neuartige Kombination discer Krankheit mit Syndaktyle der 4 Extrimitäten (...)).** *Klin. Monatsbl. f. Augenheilk.*, Vol. XC, p. 441, 1933.

(12) **Vogt** recalls the characteristic features of Apert's type of deformity (acrocraniosyndactyly: deformity of skull with syndactyly in the four extremities) and of Crouzon's type (dysostosis cranio-facialis: skull defects, defects of facial skeleton, ocular symptoms, no syndactyly). He reports three cases, two of which showed a combination of both Crouzon's and Apert's types; the third case is a typical Crouzon's disease. A new feature is brought out in all the three cases in the presence of an "open bite" owing to malformed premaxilla. The author advocates the terms dyscephaly, craniodactyly and dyscephalo-dactyly respectively for Crouzon's type, Apert's type and the new combination described. Of ophthalmoscopic interest is the protrusion of the

globes, divergence and frequently optic atrophy following papill-oedema. A hereditary factor has been demonstrated in some cases of Crouzon's disease; linking of features as an explanation of this affection deserves consideration.

ARNOLD SORSBY.

(13) **Bein, K. and Michniewicz, L. (Warsaw). — Is Oguchi's disease confined exclusively to the Mongolian races? (Ist die Oguchische Krankheit ausschliesslich an die mongolische Rasse gebunden?)** *Klin. Monatsbl. f. Augenheilk.*, Vol. LXXXIX, p. 687, 1932.

(13) In 1907 Oguchi described a case of unusual nightblindness. Since then other cases have been reported in Mongolians. In addition to the disturbance in the light sense there is a peculiar greyish discolouration of the fundus, involving the arteries and veins which become difficult to distinguish from each other. These fundus changes disappear when the patient is made dark adapted. To one case in a German (Scheerer, 1927) and two in Jews (Endelmann, 1931) **Bein** and **Michniewicz** add now an undoubted additional case occurring in a Pole.

ARNOLD SORSBY.

(14) **Herzau, W. and Pinkus, H. (Breslau).—Contribution to the Christian-Schüller disease. (Beitrag zur Schüller Christian-Krankheit).** *Klin. Monatsbl. f. Augenheilk.*, Vol. LXXIX, p. 721, 1932.

(14) The triad of disseminate skull defect, exophthalmos and diabetes insipidus described independently by Christian (1919) and Schüller (1915) and indicated by Hand (1893) is now generally grouped with the lipoid disturbances. The areas of absorption, even in the skull, are frequently well marked in the orbit. This fact and the appearance of exophthalmos brings early cases to the ophthalmologist.

Herzau and **Pinkus** describe a case in a boy, aged 6 years. At the age of 3 years the parents noted his great thirst, frequent micturition and mild psychic disturbances. He came under the care of the present observers for exophthalmos of the right eye and a swelling on the outer side of the orbit, which was found to have a fistulous track. Diagnosed at first as tuberculosis of the orbital wall, the true nature of the affection was only recognized when later on the characteristic X-ray appearance of the skull developed. A special point in this case is the presence of elephantiasis of the penis, held by the authors to be caused by mechanical obstruction. Histological examination of soft bone at an affected area in the skull shows the typical xanthoma appearances seen in this affection.

ARNOLD SORSBY.

(15) **Campbell, A. W.—The treatment of migraine.** *The Med. Jl. of Austral.*, Vol. I, p. 36, 1933.

Campbell discusses briefly the theories concerning the aetiology of migraine; in particular, conceptions about intracranial vasomotor spasm, anaphylaxis, endocrine disturbances affecting the thyroid and ovaries, and peripheral disorders such as refractive errors, diseased turbinates, adenoids, constipation, dysmenorrhoea and others.

He advises sufferers from migraine to eat sparingly of meat, drink plenty of water and to take much exercise in the open air. Treatment by the injection of foreign proteins such as peptones, milk and horse serum; by drugs, bromides, luminal, nitroglycerine, aspirin and morphia; endocrine glandular extracts, sympathectomy and attention to refractive errors is briefly discussed.

H. B. STALLARD.

IV.—LENS

(1) **Wolfsohn-Jaffé, Else (Berlin).—Hereditary anterior capsular cataract. (Hereditäre vordere Kapselkataract).** *Klin. Monatsbl. f. Augenheilk.*, Vol. XCI, p. 236, 1933.

(1) Wolfsohn-Jaffé reports cataract in two generations. The mother, one daughter and one son were affected; the father, one daughter and son were normal. The inheritance was therefore dominant. Of interest was the fact that whilst mother and the affected son had anterior polar cataract, the affected daughter had anterior capsular cataract. The two forms are, therefore, genetically equivalent.

ARNOLD SORSBY.

(2) **Roese, H. F. (Greifswald).—Ectopia lentis in four generations. (Eine durch vier Generationen vererbte angeborene Linsenektopie).** *Zeitschr. f. Augenheilk.*, Vol. LXXXI, p. 149, 1933.

(2) Roese gives a family tree of 30 individuals over four generations with nine affected persons. The mode of inheritance was dominant. From a description of the case it appears that subluxation may in time become complete dislocation, that glaucoma is apt to develop, that in dislocation into the anterior chamber extraction of the lens does not always succeed, even if eserine is employed before operation. In most of the patients axial myopia with fundus changes were present.

ARNOLD SORSBY.

(3) **Vogt, A. (Zürich).—Glass-blowers' cataract. (Der Feuerstar).** *Klin. Monatsbl. f. Augenheilk.*, Vol. XCI, p. 721, 1933.

(3) **Vogt** reviews the literature on the subject and stresses the fact that ultra-red rays (800-2,500$\mu\mu$) predominate in the spectrum of the kilns. Reference is also made to the laboratory experiments on the subject. The author dismisses exogenous heat and convection currents as causes of the cataract, pointing out the absence of cataract as an occupational disease in stokers. Some colloido-chemical change in the lens protein is held to be a possible explanation.

ARNOLD SORSBY.

(4) **Löwenstein, A. (Prag).—On the clinical and histological characters of endocrine cataract. (Ueber die klinische und histologische Form der innersekretorischen Kataract. Versuch einer Abgrenzung).** *Arch. f. Ophthal.*, Vol. CXXXII, p. 224.

(4) **Löwenstein** in this paper refers to the lens opacities arising from disturbances of internal secretion that are found in tetany, neurodermatitis, myxoedema, probably in sclerodermia, and less certainly in myotonia; those observed in young diabetics, it is fairly certain, are of similar origin.

This form of cataract, of which the clinical characteristics are a shield-shaped opacity with sharply defined festoon-like outline situated in the anterior layers of the anterior cortex, he holds, is of more frequent occurrence than is generally supposed. All cases of such lens opacities in young individuals are to be regarded as suspicious, even when there are elsewhere no clinical signs of endocrine disturbance, the proof of which is demonstrable in only a small proportion of cases.

He finds an explanation of the shape and arrangement of these opacities in the toxic action of endocrine products on localized areas of the lens capsule epithelium; these toxic products penetrate the lens capsule and lead to changes in the epithelial cells and opacity of the subcapsular lens fibres, and as these affected cells move towards the equator they develop into greatly altered lens fibres.

The author regards it as of some importance to separate the clinical conception of senile cataract from that of this endocrine variety, and contends that there is no foundation for the view that all senile cataracts are of endocrine origin, and still less for the claim of their cure by endocrine therapy; even definite endocrine cataracts seem to be not only not brought to a standstill by administration of the specific endocrine, but to continue in their

progress, and the effect of insulin in young diabetics provides no real exception to this rule.

According to his view senile cataract arises from physical changes in the colloid of the lens capsule corresponding exclusively to the age, and these changes lead to an alteration in its permeability for some of the constituents of the aqueous.

THOMAS SNOWBALL.

(5) **Borsellino (Palermo). — Experimental endocrine cataract. (La cataratta endocrina sperimentale).** *Arch. di Ottal.*, January-February, 1934.

(5) Cases have been reported in which surgical interference with the thyroid has been followed by the appearance of cataract and this accident seems especially common (though still rare) when the parathyroid has been attacked.

The genesis of this condition has been variously ascribed to toxins, which the absence of the gland prevents the organism from neutralizing in the normal way, to alterations in the composition of the aqueous humour, to variations in the calcium metabolism, and to tetany. **Borsellino** has tried to produce cataract in rabbits by the removal of the thyroid and parathyroids. Six rabbits suffered thyroidectomy; five had the parathyroids removed. The eyes were examined, under atropine mydriasis, every week for months, by means of the slit-lamp. In two of the latter group of five, opacity appeared in the lenses after about a month from the operation; these opacities were very small and would have escaped any but a very careful examination. They showed no further development. Removal of the thyroid alone in no case was followed by cataract.

HAROLD GRIMSDALE.

(6) **von Szily, A. (Münster). — Dystrophia epithelialis lentis adiposa.** *Klin. Monatsbl. f. Augenheilk.*, Vol. XC, p. 607, 1933.

(6) **von Szily** illustrates and describes an unusual lens opacity in both eyes of a man, aged 59 years. There was an anterior cortical cataract obstructing the normal pupil. The right lens was extracted successfully and histologically cholesterin crystals and fat débris were found in the central area of the lens beneath the epithelium; the adjacent lens fibres were normal. The aetiology could not be established. The author proposes the name given in the title of his paper.

ARNOLD SORSBY.

V.—GLAUCOMA

(1) **Löhlein, W. (Freiburg).—On the aetiology of juvenile glaucoma. (Beitrag zur Aetiologie des "Glaukoms der Jugendlichen").** *Zeitschr. f. Augenheilk.*, Vol. LXXIX, p. 524, 1933.

(1) **Löhlein** reports a case of juvenile glaucoma beginning at the age of 10 years. The affection was controlled by bilateral trephining at 15 years; but four years later syringomyelia was diagnosed on findings which had begun to appear at the age of 9 or 10 years. The author argues that the same vasomotor disturbances underlie the two conditions in his case, though he would not apply this conception universally.

ARNOLD SORSBY.

(2) **Mészáros, K. and Toth, Z. (Budapest).—The peripheral circulatory system in glaucoma patients. (Ueber das periphere Gefässystem von Glaukomkranken).** *Klin. Monatsbl. f. Augenheilk.*, Vol. XC, p. 67, 1933.

(2) **Mészáros** and **Toth** investigated the capillary circulation in 23 cases of glaucoma. Observations were made on the blood pressure, capillary pressure, and reactive hyperaemia in the thenar eminence, the back of the hand, the mucosa of the lips, and the bulbar conjunctiva. They conclude that the vessel and capillary systems of glaucoma patients show vaso-neurotic disturbances of the Müller type, and hold that glaucoma is an expression of the general disturbance.

ARNOLD SORSBY.

(3) **Sanguinetti (Ravenna).—Glaucoma. (Considerazioni cliniche e statistiche sul glaucoma primario).** *Lett. Oftal.*, May, 1934.

(3) **Sanguinetti** gives the number of glaucomatous patients who attended his clinic during the years 1926 to 1932 inclusive. They amount to 232, of which 11 were acute (10 women and one man) and the remainder chronic and absolute (140 men, 81 women).

The number of males suffering from chronic glaucoma is seen to be much greater than the number of women though the proportion of women in acute glaucoma to men, is as 10 to one. In the early years of the period under record, there was a very considerable number of cases in which the disease had been allowed to progress to complete bilateral blindness; thanks to the efforts of the clinic and the knowledge of the benefits derivable therefrom, there have been no cases seen of total blindness from glaucoma during the

last three years. With regard to surgical treatment, the author has seen several cases of late infection and loss of the eye after trephining and for this reason has recently preferred Lagrange's method of combining sclerectomy with iridectomy.

HAROLD GRIMSDALE.

(4) Trematore (Perugia). The alkalinity of the blood in glaucoma. (L'alcalescenza del sangue nei glaucomatosi). *Lett. Oftal.*, April, 1934.

(4) The theory of glaucoma which is most current at the present time would refer the variations of pressure in the eye to alterations in the vitreous gel, determined by its pH.

The degree of alkalinity of the vitreous will vary with the composition of the aqueous humour, there being present "buffer" salts which neutralise any large change. It seems likely that the composition of the aqueous depends finally on the composition of the blood and therefore it is of importance to know the amount of alkalies contained in this. The buffer salts in the blood maintain the pH. steady within very small limits; **Trematore** has, therefore, attempted to measure the reserve alkalies in the blood of glaucomatous subjects and has compared it with the reserve in normal subjects.

The difference is small, but there seems to be a larger alkaline reserve in the glaucoma patients. He concludes that this may be an adjuvant cause, but there must be other determining causes.

HAROLD GRIMSDALE.

(5) Giannini (Pisi).—The relation between intra-ocular tension and visual acuity in glaucoma. (Sul comportamento del visus in rapporto al comportamento della tensione endoculare nelle varie forme e nei vari stadi del glaucoma). *Ann. di Ottal.*, April, 1934.

(5) As a result of observations on a number of subjects of glaucoma, extending over a considerable time, **Giannini** concludes that there is great variation in the behaviour of vision in the different sufferers, even in those in whom the disease seems to run an identical course. The younger seem to bear rise of tension better than the aged. Sudden rise of tension in eyes chronically affected by high tension, is likely to cause a sudden and often serious impairment of vision. Eyes can put up with a moderate persistent rise without obvious damage for a considerable time. The ophthalmoscopic signs are not parallel to the visual disturbance.

HAROLD GRIMSDALE.

(6) **Tristaino (Palermo).—The relation of arterial and intra-ocular pressure to glaucoma. (Pressione arteriosa, tensione endoculare e suoi rapporti col glaucoma).** *Rass. Ital. d'Ottal.*, April, 1934.

(6) **Tristaino** has experimented in rabbits on the relation between the arterial and intra-ocular pressure; compressing the abdominal aorta, he finds that the intra-ocular pressure rises as the general arterial pressure rises. If the superior cervical ganglion of one side be removed, there is no rise of intra-ocular pressure in the corresponding eye, but when after an interval, the eye on the side of the operation has recovered its normal tone, compression of the aorta causes a higher intra-ocular pressure on that side.

HAROLD GRIMSDALE.

(7) **Stallard, H. B. (London). — Glaucoma.** *The Practitioner*, May, 1934.

(7) In this article on glaucoma **Stallard** gives a very useful epitome of the pathology of primary glaucoma as far as it is at present known.

"An appreciation of the structure and function of the tissues in the vicinity of the filtration angle is essential to an understanding of many of the features of glaucoma. The balance between the production and drainage of the intra-ocular fluid, the part played by the intra-ocular blood pressure and blood volume, the distensibility and compressibility of the ocular tunics, the physical states of the vitreous and lens, the hydrodynamics of the moving intra-ocular fluids, the effects upon the ocular contents of certain abnormal chemical constituents in the blood, toxins, hormones and the interaction of the sympathetic nervous system are among some of the important problems concerned in the solution of the cause of glaucoma. Controversy persists about the manner in which the intra-ocular fluid is formed and drained from the eye. Probably it is produced by a process of filtration through the capillaries of the ciliary body and secretion through the ciliary epithelium; the fluid destined for the anterior chamber is believed to be formed from the pars plicata of the ciliary body and that which passes into the vitreous from the pars plana. The fluid circulates forwards behind the iris, through the pupil and into the anterior chamber and also some passes posteriorly into the vitreous. Drainage is probably effected in the filtration angle by a combination of suction by the backward and inward displacement of the scleral spur on contraction of the longitudinal and circular fibres of the ciliary muscle and by the osmotic pressure exerted in the canal of Schlemm, which is in intimate communication with a deep scleral plexus of veins. Relaxation of the ciliary muscle allows

the scleral spur to move forwards and outwards again and the ligamentum pectinatum by its elastic recoil to become approximated to the filtration angle. It is probable that some drainage takes place along the peri-vascular lymphatic sheaths of the central retinal vessels at the optic disc. Aqueous fluid entering the open anterior crypts of the iris is drained along the peri-vascular lymphatics of the iris stroma.

The essential cause of an increase of intra-ocular pressure is obstruction to drainage at the filtration angle. In acute congestive glaucoma this is effected by oedema and turgidity of the ciliary body and engorgement of the iris, in chronic glaucoma by the swelling of the vitreous or the lens pressing forward the iris root and ultimately causing this to adhere to the posterior surface of the periphery of the cornea. The production of a vascular crisis leading to engorgement of the capillaries of the uveal tract will initiate a rise of intra-ocular pressure. Such a state of affairs has been produced experimentally by Duke-Elder, who, by raising the intra-ocular pressure above that in the ophthalmic artery for a variable duration, found that within 30 seconds of releasing the pressure there was vaso-dilatation of the iris vessels, increased permeability of the capillaries and a histamine-like substance in the aqueous. By stroking the iris with an intra-ocular cannula similar events accompanied by a rise of intra-ocular tension were observed. Duke-Elder explains the acute vascular crisis, increased permeability of the intra-ocular vessels and destructive rise of intra-ocular pressure as due to the liberation of histamine and the dissemination of its influence over the uveal tract by a system of axon reflexes. The instillation of histamine into the conjunctival sac of a cat will cause a rise of intra-ocular pressure and a vaso-toxic substance has been obtained from the aqueous in acute glaucoma and is probably related to histamine. Some cases of glaucoma are comparable to an oedema of the uveal tract. Maynard reported 20 cases of glaucoma in epidemic dropsy in Calcutta.

Anatomical factors disposing to glaucoma are a small globe, rigidity increasing with age, prolongation of the ciliary processes allowing the lens to move forward, increase in size of the lens which continues to grow after the rest of the eye has ceased to enlarge, and sclerosis of the ligamentum pectinatum. Hereditary and familial predisposition plays a part in some cases. Infantile glaucoma (buphthalmos) is due to defective development of the filtration angle and its structures. There is a faulty line of iris cleavage and the canal of Schlemm may be absent.

These are by no means all the facts implicated in the aetiology of glaucoma. In the early stages of the disease it is impossible to detect any histological changes by any methods at our disposal

to date. The material available for examination is mainly eyes badly damaged by long-standing disease. In the earlier stages the iris root is applied to the posterior aspect of the periphery of the cornea, but can be separated from it. Aqueous is absorbed through the iris crypts and from the stroma passes through the ligamentum pectinatum into the canal of Schlemm. Later adhesions occur, but drainage is still effected along the iris stroma. Finally the iris becomes adherent, atrophic, bunched up with a semi-dilated pupil and no absorption takes place through the crypts. Ectropion uveae and the formation of new vessels on the anterior surface of the iris follow. Atrophic changes also occur in the ciliary body, the ciliary processes becoming drawn out and hyaline deposits occurring in the sub-epithelial connective tissue. The choroid is flattened and atrophic and there is perivascular lymphocytic infiltration around the venae vorticosae and proliferation of the lining endothelium. Degenerative changes occur in the nerve fibre and ganglion cell layers of the retina, and the lamina cribrosa becomes displaced backwards, producing cupping of the optic disc. Through lack of adequate nutrition the lens becomes opaque and finally the eye is blind and painful."

The signs, symptoms and treatment are also outlined in this paper.

A. F. MACCALLAN.

(8) **Meyerhof, Max (Cairo).—Atrophy of the iris in an early stage of glaucoma.** *Bull. Ophthal. Soc. of Egypt*, 1932.

(8) **Meyerhof** has observed the occurrence of depigmentation and atrophy of the iris in different stages of glaucoma. Atrophies of different parts of the eyeball are well-known anatomical effects of increased intra-ocular pressure. Besides the head of the optic nerve the uvea is most likely to suffer from such atrophies, in the first place the choroid and ciliary body. Disturbances of the iris pigment and atrophy of the stroma have been known to be complications, particularly in the later stages of glaucoma. The author gives details of five cases which came under his observation.

A. F. MACCALLAN.

VI.—MISCELLANEOUS

(1) **Jess, Adolf (Giessen).—Sympathetic ophthalmia.** *Lancet*, June 30, 1934. *Münch. Med. Wochenschr.*, May 25, 1934.

(1) *The Lancet*, in a leading article, records three cases reported by **Jess** which show the uncertainties of sympathetic ophthalmia, and seem to be of sufficient importance to be transcribed into this

Journal. *Case* 1.—Aged 26 years. Perforating wound of left eye by granite splinter; prolapse of iris. Splinter removed two days later, iris replaced. Three weeks later signs of irritation in right eye. Excision of left proposed. This refused and patient went home. Two days later returned. The signs of sympathetic were no longer doubtful and though the exciting eye was excised at once the sympathising eye went from bad to worse, so that despite energetic treatment the patient went blind. *Case II.*—Perforating gonorrhoeal ulcer in right eye. Prolapsed iris cut off and eye covered with conjunctiva. Twelve weeks later signs of sympathetic in left eye. Exciting eye removed showed an infiltration indistinguishable from that caused by tuberculosis. Ten months' treatment of the left (sympathising) eye resulted in cure with complete restoration of vision. *Case III.*—This was a case of cataract extraction with post-operative iritis which quieted down with complete restoration of vision. Two years later there was typical sympathetic ophthalmia of the second eye, and after more than a year's treatment this had to be enucleated. Here it was (presumably) the exciting eye which remained quiet and retained good vision. The lessons to be drawn from these cases by *The Lancet* are judicially put forward, but may perhaps be omitted in a specialist Journal.

ERNEST THOMSON.

(2) **Michail, D. (Cluj, Roumania).—Pigmentation of the disc. (La pigmentation de la papille).** ***Arch. d'Ophtal.***, March, 1934.

(2) As is usual, rare cases come in runs. Michail has had a succession of cases of pigmentation of the disc since 1933, all accompanied by some other clinical manifestations. *Case I.*—Right fronto-parietal traumatism, cerebral tumour of the corresponding right frontal lobe, pigment patch on the right disc. *Case II.*—Traumatism of the right superciliary region, fracture of the corresponding optic canal, consecutive atrophy of the optic nerve with linear pigmentation of the disc. *Case III.*—Left congenital zonular cataract, operative aphakia, partial atrophy and tigroid pigmentation of the corresponding disc, peripapillary choroidal conus. *Case IV.*—Muliple pigmentary cutaneous naevi, melanosis of the left sclerotic and iris, powdery pigmentation of the anterior surface of the lens and leaf-like pigmentation of the disc. These four cases all show monolateral pigmentation of the disc accompanied in each case by some other complex of clinical manifestations. They are the only cases seen during the past 15 years and have come as one of the surprises of ophthalmoscopic examination. This is a fairly long paper containing 52 references. In it the author studies the literature as regards the length and depth of

the pigmentation, the functional state of the eyes, the ocular lesions which coexist, and the origin of the pigment, but his conclusions seem to be somewhat negative as indeed is to be expected where a rarity is concerned.

ERNEST THOMSON.

(3) **Juhász-Schaffer, A. (Berne).—Circumscribed hole formation at the optic disc. (Umschreibene Grubenbildung des Sehnervenkopfes).** *Zeitschr. f. Augenheilk., Vol. LXXXI,* p. 314, 1933.

(3) **Juhász-Schaffer** recalls that about 40 cases of hole in the disc have been described, and adds two cases of his own. One appears as a greyish round projection, 1/5 disc diameter in size, situated in the upper nasal sector of the disc; on movement of the globe the projection moves to reveal a hole 5 D. deep. In a second case there was an excavation in the temporal area of the disc. The author could see no evidence in his cases of glial cyst, nor any connection with retino-ciliary vessels.

ARNOLD SORSBY.

(4) **Hesse, R. (Graz).—The anatomical basis of angiomatosis of the retina. (Ueber die anatomischen Grundlagen der von Hippelschen Netzhauterkrankung).** *Zeitschr. f. Augenheilk., Vol. LXXIX, p. 252, 1932.*

(4) **Hesse** gives a detailed description of the clinical appearances in a case of angiomatosis retinae with exudates. Only one eye was affected and ultimately had to be excised because of secondary glaucoma. A full account of the histological appearances is given together with four illustrations. The author concludes that the primary lesion is vascular and not glial proliferation as Meller and Marburg hold. He further argues that the exudative retinitis (Coats' disease) is a secondary manifestation and not a clinical entity on its own.

ARNOLD SORSBY.

(5) **Sobol, I. M. (Nieschin, Ukrania).—Osteoma of the orbit. (Osteoma de la orbita).** *Rev. Oto.-Neuro.-Oftal. y de Cirurgia Neurologica,* Vol. IX, p. 188, 1934.

(5) **Sobol** has written a lengthy article on orbital osteomata. He has collected all the available literature that has been written on the subject and with its aid has given a concise and complete list of the theories of the pathology, origin, signs and symptoms, and treatment. Orbital osteomata are rare tumours; he himself has only met one case. This was in a normal, healthy girl, aged 18 years. The only early symptom was periodic headache for a

year before the appearance of a supra-orbital swelling; the headaches becoming gradually constant. The local signs were rounded supra-orbital swelling, ptosis, and diminished upward and outward movements of the eye. Vision was normal. The tumour arose from the frontal sinus, operation was entirely successful, all signs and symptoms subsiding afterwards. Osteomata arise in most cases from the frontal sinus and more rarely from the ethmoid. The size varies from that of a pea to a hen's egg, and very rarely to the size of a child's head. They are usually slow growing and mostly occur soon after the age of puberty. The only early symptom may be headache or neuralgic pains in the region supplied by the trigeminal nerve. Nasal haemorrhages, catarrh and itching occur in those arising from the ethmoid. Later signs are ptosis, impaired movement of the eyeball, diplopia, diminished field, enlarged pupil, exophthalmos, papilloedema, loss of vision and optic atrophy. Inflammatory changes in the sinus may give symptoms of acute sinusitis. Rarely there is invasion of the cranium giving rise to loss of memory, epileptic fits, and cramps in the limbs. He favours the theory that the growth is formed from over-activity of the periosteal cells rather than from the ossification of enchondromata. Differential diagnosis has to be made from exostosis, mucoceles, chondromata, fibromata, etc. In all cases he advised X-ray as an aid in differential diagnosis and location of the tumour and the size.

The only treatment for these tumours is operation. Difficulties are due to the extreme hardness of these tumours, to their having at times a broad base and also to severe haemorrhages. Later dangers are those of venous infection from neighbouring sinuses in the nose and rarely meningitis.

E. E. CASS.

(6) **Hudelo, A. (Paris).—Astigmatism following operation for chalazion.** *Arch. d'Ophtal.*, January, 1934.

(6) **Hudelo** has only found one case in the literature similar to this one. It concerned a man, aged 31 years. The patient informed the operator that ever since the operation upon a little sebaceous cyst of the right temple it had been almost impossible to obtain anaesthesia. Lest it should be considered that the patient was a nervous subject, the author tells us that he was a sporting man, an aviator and that he was bearer of many cicatrices which were witnesses of numerous traumatisms to which he had been exposed without fear. The cyst was situated in the middle of the right eyelid, was non-inflammatory and painless. Nevertheless, the anaesthesia took a full hour and was partial even then. Nothing abnormal was found and there was no haemorrhage. The following morning the patient turned up complaining that he had suffered

much pain although everything was in order, and, in the evening, the pain having passed off, the patient telephoned that he now saw very badly with the operated eye. He was found to have an astigmatism corrected by a glass of strength −1·0 D. cyl. axis 105°. With this glass his original vision of 10/10 was restored. On the sixth day this astigmatism disappeared and the vision was then 10/10 without any glass.

What was the cause of the astigmatism and of its disappearance within a few days? By a process of exclusion the author concludes that it was caused by the loss of pressure of the eyelid.

ERNEST THOMSON.

(7) **Velter, E. (Paris).—The action of the facial nerve in the motor innervation of the eyelids: the superior facial. (La participation du nerf facial a l'innervation motrice des paupières: le facial supérieur).** *Arch. d'Ophtal.*, February, 1934.

(7) **Velter** points out how facial paralyses differ from case to case. In one set of cases which one recognizes as peripheral are to be found total paralyses which affect all the muscles innervated by the facial nerve; in the other, where one has to recognize a central cause, the orbicularis, the superciliary and the frontal are spared, at any rate, partially. It is this clinical and physiological idea which has caused neurologists to suspect the existence of a particular kind of innervation which has led to the conception of a superior facial. The author then goes on to study the clinical facts, and the central connections of the facial nerve and concludes that physiologically and clinically the relative autonomy of the superior facial must be upheld. This autonomy does not seem to depend on the existence of a special cortical centre, but rather of bilateral cortico-nuclear connections which have a double path; the path of the geniculate bundle on the one hand (the pyramidal path), and that of the aberrant fibres on the other. The integrity of the latter permits of a sufficient substitution, in the case of a lesion of the pyramidal path in central hemiplegia, of the physiological synergies belonging to the muscles innervated by the superior facial.

ERNEST THOMSON.

(8) **McIlroy, J. Hamilton (London).—Investigation into the incidence and progress of myopia in children.** London County Council, Annual Report of the Council, 1932, Vol. IV, Part 3, Public Health—Medical Supplement to the Report on the Hospital Services, p. 40.

(8) **Hamilton McIlroy** analyses the records of 1,702 cases seen for the visual defect in two L.C.C. Centres between 1926 and 1933.

Three hundred and fifty-four of these cases had undergone re-examination at some interval of time varying from 1 year 6 months to 7 years. The ages, with few exceptions, varied from 5 to 14 years. For the whole group hypermetropia accounted for 78·79 per cent. in the case of boys and 76·90 per cent. in the case of girls. The corresponding figures for myopia were 20·07 per cent. and 22·43 per cent. respectively. Emmetropia accounted for 1·13 per cent. and 0·66 per cent. respectively. The incidence of myopia over 5·0 D. in boys was 1·38 per cent. and 1·65 per cent. in girls. Moderate myopia (2·0–5·0 D.) accounted for 8·15 per cent. and 8·06 per cent. respectively, and low myopia (-2·0 D.) for 10·54 per cent. and 12·70 per cent. The incidence of high hypermetropia was higher for boys than for girls, 11·29 per cent. against 7·18 per cent.

In analysing the 354 cases followed up for a period between 1 year 6 months to 4 years, and few for a longer period, the author found a decrease in hypermetropia in 215 cases, and an increase in myopia in 81 cases, no change in 21, whilst in 39 cases the refraction of the eye became less. From a mathematical analysis it was argued that whilst the average increase in refraction is 0·26 dioptres per year for boys it is rather more for girls, *viz.*, 0·30 D. The increase in the refraction in hypermetropes separately is practically identical for both boys and girls (0·26 D. as against 0·27 D.), but in myopia there is a definite sex difference, 0·47 for boys against 0·59 for girls. Referring to the decrease in refraction seen in both hypermetropia and myopia (39 cases), the author holds that this does not represent an actual condition, but is to be explained by incomplete cycloplegia.

The paper is illustrated by a mass of tables and graphs.

ARNOLD SORSBY.

(9) **Sgrosso (Perugia). — Traumatic myopia and Frenkel's syndrome. (La miopia traumatica e la sindrome traumatica del segmento anteriore di Frenkel).** *Boll. d'Ocul.*, April, 1934.

The pathogenesis of the lesions in the so-called Frenkel's syndrome. (Sulla patogenesi della lesioni oculari de trauma in rapporto alla cosi detta sindrome traumatica del segmento anteriore di Frenkel). *Boll. d'Ocul.*, May, 1934.

(9) These two papers should be studied together since they complement one another. In the first **Sgrosso** details notes of a number of cases in which myopia and other symptoms have followed injury to the eye. He shows that the myopia which appears immediately after the injury is almost always rapidly replaced by the former refractive state. He points out that this symptom is seldom found except where the patient has considerable accom-

modative power and, therefore, is seldom seen in men over 45 years. He attributes it in some cases to spasm of the ciliary muscle or to relaxation of the suspensory ligament allowing the lens to come forward. In some cases after more severe injury the myopia is due to subluxation of the lens; whereas in this case, the tension of the eye is often raised, in the former there is often diminished tension.

That the myopia should often be due to spasm of the ciliary muscle, seems improbable when we remember how frequently it is associated with paresis of the sphincter of the iris. Occasionally however there may be miosis, and in these instances we may presume a spasm both of the ciliary muscle and of the sphincter iridis. In the second paper Sgrosso discusses the mechanics of these injuries.

HAROLD GRIMSDALE.

(10) **Jackson, Edward (Denver).—Cycloplegia for diagnosis.** *Arch. of Ophthal.*, January, 1934.

(10) **Jackson s** article deals with various points in the use of cycloplegics. One of considerable importance is the increase in the size of the pupil. This may introduce fallacies, since the peripheral part of the dilated pupil may show errors of refraction which are different from any in the central zone. In some cases this is of no importance, since no part of the peripheral zone may be able to produce an image which can compete with that formed by the central zone. In other cases, however, peripheral refraction may interfere, and the axis of a cylinder chosen at a post-mydriatic test may differ from that chosen under cycloplegia. Few comparative tests have been made on the relative strengths of cycloplegics since the author's work in 1895, when he rated them as follows:—Homatropine 1; atropine 30; and hyoscyamine 75. It it important to realize that dilatation of the pupil does not necessarily indicate cycloplegia, and the author states that useful cycloplegia requires a 10 times more powerful drug than is needed to produce complete mydriasis. To produce the optimum effect, a cycloplegic should be dropped on the upper edge of the cornea and be allowed to spread over the entire corneal surface before it is wiped away by the lid or diluted with the lacrymal secretions. The reason for this is, that it is only by diffusion through the cornea that the drug finds its way into the eye. With regard to dosage, the larger this is the longer the maximum effect persists; when a small dose is employed, the maximum may never be reached. For this reason it is advisable to make more than one application.

F. A. W-N.

NOTES

French Course in Surgery of the Eye

THE annual course in the surgery of the eye is announced by Prof. Terrien and his colleagues at the Hôtel Dieu for the month of October. As usual, the course embraces all the usual ophthalmic operations as well as radium therapy. It is complete in twelve lessons. The price has been fixed at 300 francs; and a certificate of attendance will be issued to each student at its close.

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Ophthalmological Congress in Brazil

A CONGRESS, sponsored by the Sociedade de Ophthalmologia de São Paulo, will be held at São Paulo from January 19 to 25, 1935. Scientific contributions will be welcomed from any country in the world and will be published in the *Transactions*; 25 reprints being sent to the author.

Further information may be obtained from Dr. M. E. Alvaro, Rua Cesario Motta 2, São Paulo, Brazil.

FUTURE ARRANGEMENTS

1934

October 2.—Midland Ophthalmological Society, at Birmingham. (Annual Meeting)

October 19.—North of England Ophthalmological Society, at Manchester.

November 16.—North of England Ophthalmological Society, at Bradford.

December 7.—North of England Ophthalmological Society, at Leeds.

1935

February 15.—North of England Ophthalmological Society, at Newcastle-on-Tyne.

March 15.—North of England Ophthalmological Society, at Liverpool.

April 12.—North of England Ophthalmological Society, at Sheffield.

CONTEMPORARY OPHTHALMIC LITERATURE

American Journal of Ophthalmology. *August, 1934.*

WHEELER. Principles of modern surgery in ophthalmology.
HARDESTY. Infantile glaucoma.
GOLDENBURG. Progressive exophthalmos in thyroid disease.
BRUNER. The operative treatment of cataracts.
SIMPSON. A tangent rule as a diagnostic instrument.
EAMES. Low fusion convergence as a factor in reading disability.
GOOD. Kinetic velonoscopy.
CHANCE. A view into the ophthalmology of Galen.
KRIMSKY. Symmetric incomplete annular scotoma of tobacco origin without enlargement of the blind spot.
SHAPIRA. Micro- and spherophakia with glaucoma.
RICE, SORY, SMITH, FAED and DRAKE. The effect of diet and vitamins on trachoma.

Archives of Ophthalmology. *August, 1934.*

BIELSCHOWSKY. Divergence excess.
SPAETH. Swelling of the nerve heads with arachnoiditis and unusual changes in the visual fields.
ENNEMA. Ophthalmomyiasis subretinalis.
BEIGELMAN. Acquired cysts of the sclera.
GOLDSTEIN and WEXLER. Tumour of the orbit in a case of osteochondrofibrosarcomatosis.
FINLAY. Visual defects in pregnancy.
KATZ. Some principles of plastic surgery of the eyelid, with special reference to the Hungarian school
MAYER. Use of the fundus colorimeter.

Annales d'Oculistique. *July, 1934.*

NÉCHITCH. Our new giant electro-magnet with the truncated core and the methods of extraction of the foreign bodies of the eye and orbit with the help of the co-axial poles.
AMSLER. Angiopathy of the retina.
WESKAMP. Meningoblastoma of the lesser wing of the sphenoid.
LAGRANGE. Principles of technique in muscular advancement.

August, 1934.

MARQUEZ. An atypical case of Mikulicz's syndrome.
KALT. My actual operative procedure for senile cataract.
AMAT. Foreign bodies in the vitreous. Dangers of extraction by the anterior route.
AUBINEAU. Semiological value of "Tubercule de Carabelli-Sabouraud" in hereditary ocular syphilis.
NÉCHITCH. Our new giant electro-magnet with the truncated core and the methods of extraction of the foreign bodies of the eye and orbit with the help of the co-axial poles.
TERSON. Some ideas and interpretations of raised tension in glaucoma.
——— Historical documents on sclerectomy.

Archives d'Ophtalmologie. *July, 1934.*

VAN DER STRAETEN and APPELMANS. Notch in an eyelid and palpebral coloboma.
GONIN. Ocular hypotony and its relations with retinal detachment.
ROLLET. Detachment of the retina and deficiency of the procedure for fixing and holding this membrane.
OSTWALT. On the form of correcting glasses to give exact images.

August, 1934.

WEEKERS. The positive and transitory central scotoma in chronic alcoholic intoxication.

JEANDELIZE, BAUDOT and GAULT. Treatment by diathermy coagulation of retinal detachment without a visible tear or with an uncertain tear.

PESME. A case of hydrocephalus with buphthalmos.

COSMETTATOS. A rare form of persistence of the pupillary membrane with microphthalmos.

VIALLEFONT and TEMPLE. Arachnodactyly or Marfan's syndrome. Ocular troubles of a familial and hereditary character.

Revue Internationale du Trachome. *July, 1934.*

GALANTE. Biomicroscopical study of the limbal region of the eye in trachomatous subjects.

MULLER. The part played by the climate in the aetiology of trachoma.

SÉDAN. Trachoma and spring catarrh.

Klinische Monatsblätter für Augenheilkunde. *August, 1934.*

VON SZILY. Transmission experiment with material of human sympathetic ophthalmitis to fowls and monkeys, also observations on the nature of the exciting causes.

SCHMIDT. Isolated melanosis of the cornea. Eight years after excision of a superficial melano-sarcoma of the corneal limbus.

SCHNEIDER. Indirect injury of the retina through head and body shocks. Traumatic retinal angiopathy.

OCHI. About a species of micro-organism in trachomatous tissue.

VON PAPOLCZY. Disseminated sarcoma of the iris in the anterior chamber arising from traumatic uveitis.

FISCHER. Zonular extensibility and accommodation.

ISAKOWITZ. An axiomatic objection to the von Pflugksche accommodation theory.

LENHARD. Short notes on the work of Gundo Boehm "On the form of the lens albumen particles."

Archivos de Oftalmologia Hispano-Americanos. *July, 1934.*

MORAX. Papers on the gonococcus of the purulent ophthalmias in hot countries.

MIRANDA. The intra-ocular auto-haemo-therapy in tuberculosis of the anterior segment of the eye.

Revista de Ophthalmologia. *June, 1934.*

DE ANDRADE. Cases of hemicrania with atrophy of the optic nerve.

ORTIZ. A new clinical form of Charlin's nasal nerve syndrome.

ALVARO. Results obtained with a myocampter in the treatment of strabismus.

Revista Oto-Neuro-Oftalmologica y de Cirurgia Neurologica Sud-Americana. *July, 1934.*

PAVIA and DUSSELDORP. Observations of the persistence of myelinated fibres.

DUBOIS. Exudative retinitis with arterial hypertension.

August, 1934.

ROSENGRAN. Juvenile amaurotic idiocy.

PAVIA and DUSSELDORP. Rare aspects of a haemorrhage in the fundus of the eye. Its evolution.

PAVIA. Degeneration of the macula and adjacent regions.

September, 1934.

PAVIA. Berlin's disease and consecutive chorio-retinal alterations.

ROSENGRAN. Juvenile amaurotic idiocy.

Revista Cubana de Oto-Neuro-Oftalmiatria.

YANES. Ocular tension in cataract extraction.

CEPERO-COMAS. Diathermy in iritis.

YANES. Washing out the anterior chamber.